DisplayMaker® 72UVX/98UVX

User Manual

for DisplayMaker
UV curable inkjet printers

0706346 Rev B

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Revision Log

The following is a list of major changes and additions that have been made to this manual since it was first released.

See the accompanying *Release Notes* for specific changes to the software and hardware between manual updates.

Revision	Description
Revision B	Adds the DisplayMaker 98UVX. Chapter 2: Minor corrections made. Chapter 3: Media tables guidelines added. Media load procedures updated. Appendix A: Specifications for the DisplayMaker 98UVX added. Appendix B: Warnings/Actions table updated.

Regulatory Statements

FCC-A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

This equipment must be installed exactly as instructed in this manual using only the components supplied. If a supplied component ever needs to be replaced, it must be replaced with the same part supplied by the manufacturer. It is your responsibility to follow these instructions in order to maintain compliance with the FCC regulations. Changes or modifications not expressly approved by ColorSpan Corporation could void your authority to operate this equipment. In particular, this device must be operated with shielded cables to maintain FCC compliance.

A booklet is available from the Federal Communications Commission entitled, *How to Identify and Resolve Radio-TV Interference Problems* (#004-000-00345-4). Write to the U.S. Government Printing Office, Washington, DC 20402.

DOC (Canada)

This digital apparatus does not exceed the Class A limits for radio noise for digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Normes de Sècuritè (Canada)

Le présent appariel numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Classe A prescrites dans le réglements sur le brouillage radioélectrique édictés par le Ministére des Communications du Canada.

Telecommunications Network Statement

The ColorSpan VideoNet port on this device is not intended to be connected to a public telecommunications network. Connection of this device to a public telecommunications network in a European Community Member State will be in violation of national law implementing Directive 91/263/EEC on the approximation of laws of the Member States concerning telecommunication terminal equipment, including the mutual recognition of their conformity.

Der VideoNet port ist nicht dafür vorgesehen an ein öffentliches Telefonnetz angeschlossen zu werden. Der Anschluß dieses Gerätes an ein öffentliches Telefonnetz in einem Mitgliedstaat der EU, verstößt gegen nationale Gesetze zur Ausführung der Direktive 91/263/EEC, die sich mit der Annäherung von Gesetzen von Mitgliedstaaten beschäftigt, betreffend Telekommuniktionsanlagen und die gegenseitige Anerkennung ihrer Konformität.

About This Manual

Read this manual to unpack, set up, and use the printer.

- **Chapter 1, Getting Started,** introduces you to the main features of the printer.
- **Chapter 2, Using the Control Panel, shows** you how to use the control panel to specify printer options.
- **Chapter 3, Ink and Media,** shows you how to install ink and media.
- **Chapter 4, Calibrating the Printer,** shows you how to calibrate the printer for optimal print quality.
- **Chapter 5, Maintaining the Printer,** explains scheduled maintenance, how to recover clogged printheads, how to prepare the printer for extended power-down (such as for shipping or storage), and more.
- **Appendix A, Technical Specifications,** lists the printer's technical specifications.
- **Appendix B, Troubleshooting,** shows you how to troubleshoot common printing problems and interpret Action and Warning messages.

For further information, refer to the following ColorSpan documentation:

- *Site Preparation Guide* — explains how to prepare your site for the printer's arrival and installation.
- *Quick Start Guide* — **START HERE** to set up and install a brand new ColorMark print server, and connect and configure printers to it.
- ColorSpan Print Server Documentation — the *System Control User Guide* and *Printing Tools User Guides* shows you how to print and RIP files through the ColorSpan print server. If the printer is connected to a non-ColorSpan print server (RIP), refer to the documentation that accompanies the server.
- *Print Server & Driver Setup Guide* — explains how to configure the ColorSpan print server or RIP for printing.
- *Release Notes* and *Update Notes* — late-breaking information, update descriptions, and update instructions.
- ColorSpan web site — http://www.colorspan.com.

Conventions

This manual uses the following informational conventions:

Note	A special technique or information that may help you perform a task or understand a process.

Hinweis	Ein Hinweis beschreibt eine spezielle technik zur Lösung einer Aufgabe oder enthällt Informationen, die Ihnen eine Prozedur näher erläutert.

Caution	Alerts you to something that has the potential to cause damage to hardware, software, or data.

Vorsicht	Dieses Feld weist auf einen Umstand hin, der einen Hardware-oder Software-Schaden oder Datenverlust verursachen könnte.

WARNING	Alerts you to something that has the potential to cause physical harm to you or others around you.

WARNUNG	Eine Warnung auf weist auf einen Umstand hin, durch den Ihnen und anderen Personen ein physischer Schaden erwachsen könnte.

Other WARNING symbols used:

Electrical Hazard

Vorsicht steht unter Spannung

Lifting Hazard

Vorsicht beim Anheben

Moving Parts

Bewegliche Teile, Verletzungsgefahr.

High Intensity UV Light

UV Licht hoher Intensität. Bitte vermeiden Sie es, direkt in die Lampen zu schauen.

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CHAPTER 1

Getting Started

This chapter shows you how to get started using your printer. It includes these topics:

- Operating Requirements (page 1-2)
- Important Operating Notes (page 1-4)
- Workflow Overview (page 1-8)
- Parts Overview (page 1-14)
- Special Features (page 1-18)

Operating Requirements

Choose a location for the printer before you unpack it. Keep the following requirements in mind:

Electrical

- Use the supplied power cord. Plug it directly into a grounded electrical outlet. Do not lengthen the power cord with an extension cord; the resulting drop could damage the printer.
- Make sure the line voltage meets the requirements: 220 VAC ±10%, 20 Amps, with NEMA L6-20R locking wall receptacle (North America and Japan), OR 220 VAC ±10%, 16 Amps, single phase, with IEC 60309 wall receptacle (Europe). **See Appendix A, Technical Specifications, for details.**
- The printer requires a stable power supply to ensure acceptable output and sufficient voltage to light the UV lamps. If necessary, you can purchase and install a voltage regulator to ensure acceptable printer performance. Refer to the *Site Preparation Guide,* part number 0706274, for specifications.
- The UV lamp power supply is connected to the included power line conditioner that provides steady and consistent voltage for optimal performance.

Caution Only equipment that is specified by MacDermid ColorSpan should be connected to the line conditioner. Do not remove the safety plugs from the line conditioner outlets.

- To maintain vacuum to the printheads during printer power-down, use the auxiliary 24 volt power supply (included in the accessory kit with universal power adapters). Connect the 24 VDC jack on the vacuum/pressure assembly to either of two options:
  - **1. UPS** — customer-supplied uninterruptable power supply, output 100-240 VAC, 50/60 Hz, minimum of 15 watts of power, provides battery backup to the vacuum system in the event of a power failure.
  - **2. Wall outlet** — 100-240 VAC, 50/60 Hz, provides temporary power to the vacuum system when it is necessary to power down the printer for service.See Appendix A, Technical Specifications, for details.
- Connect the print server or RIP to a separate electrical circuit from the printer.

Environmental

- Make sure the room is well ventilated, with a temperature and relative humidity within specifications (see “Specifications” on page A-2). Optimal printing and occurs within these ranges.
- The high power UV light emitted by the curing lamps reacts with oxygen and produces ozone. This formation tends to be greatest during lamp start-up. The printer should be operated in a well-ventilated area to avoid minor effects such as headaches, fatigue, and dryness of the upper respiratory tract. Normal air movement will mix the ozone with fresh air, causing it to revert back to oxygen.
- Store media and ink in an area with similar temperature and humidity conditions as the printer.
- Locate the printer close enough to the print server (RIP) so that they can be connected with the required cable.
- Locate the printer on a flat, level floor.
- Locate the printer where its normal operating noise will not disturb quiet work areas.
- DO NOT install the printer near humidifiers, refrigerators, fans, water faucets, heaters or similar equipment.
- DO NOT install the printer in areas where the temperature changes abruptly, such as near air conditioners or in the path of direct sunlight.
- DO NOT expose the printer to flames or dust.

Important Operating Notes

- **UV CURE INK IS PERISHABLE. Unlike other inks used in wide format printing, UV cure ink has a limited shelf life. Plan to rotate your ink stock and use it promptly by the date printed on the ink box.**
- **DO NOT POWER DOWN THE PRINTER.** Constant vacuum at the printheads is required to prevent ink from flowing from the printheads when not printing. If the printer must be powered down for shipping see "Extended Power Down and Restart" on page 5-25, or apply auxiliary 24 volt power.

Caution **Do not switch off the UV lamp power supply unless the lamps have fully completed their controlled cool-down cycle** (with fans and heat extraction). Removing power from hot lamps can result in overheating and permanent damage. If sudden removal of power occurs, contact ColorSpan Technical Services before starting the printer again.

Caution Do not connect any equipment to the line conditioner for the UV power supply, except as specified by MacDermid ColorSpan.

- To dab the printheads, use only ColorSpan SolaChrome UV Printhead Flush. (See "Recover Missing Ink Jets" on page 5-7 for instructions.) DO NOT USE ISOPROYPL ALCOHOL.
- The maximum diameter allowed on the takeup spool is 7.5 inches (190.5 mm) on a 3-inch core. When the takeup spool has a diameter of 6.5-7.5 inches (165.0-190.5 mm), the control panel displays a warning about possible print quality issues. The supply-takeup system can support rolls of up to approximately 125 pounds (56.7 kg).
- The media supply may be wound either printed-side-out or printed-side-in, but the takeup, if used, must be loaded printed-side-in.
- The default head height set to 0.085 inches (2.2 mm) above the media. (The space below the carriage will measure to 0.070 inches due to the printhead protection frame around the outside of the carriage.)

- If the height of sheet-fed media exceeds 0.25 inches (6.35 mm), you must prepare the printer as follows before printing:
  - Raise the head height
  - Raise the right-side louver assembly
  - Install the left-side light-blocking mat

  The printer detects when the media thickness is equal to or exceeds 0.25 inches, and prompts you to perform these steps. See "Loading Rigid Media" on page 3-27 for instructions.
- The Media Wizard stores a set of operational parameters for predefined and user-defined media types. When you load a new media type, select an existing Media Wizard set, or create a custom set. Media Wizard parameter sets can be selected at any time from the control panel. (See "Edge-to-Edge Printing" on page 3-35 for details.)
- Enable AutoTune during long periods of unattended printing. AutoTune runs AutoJet at user-defined intervals to ensure that all jets are either working or substituted with working jets. (See "AutoTune" on page 4-4 for instructions.)
- Wear cotton gloves when loading media to prevent fingerprints that could show after printing.
- **DO NOT** rest or store a media roll on end, or you could cause edge creases that could strike the printheads during printing.
- **DO NOT** clean the printhead surfaces with a dry cloth or paper towel of any kind. Use only a lint-free (Class 100 cleanroom) cloth, such as those supplied with the printer, moistened with SolaChrome UV Printhead Flush.
- **DO NOT** reprint over any output that has not completely cured. The rubber pinch rollers could be damaged by wet ink. If ink does get onto the pinch rollers, clean them with a minimal amount of isopropyl alcohol and dry them thoroughly before printing.
- **DO NOT** set heavy objects on the power cord or printer cable; do not bend the cables or force them into contorted positions.
- **DO NOT** place heavy objects anywhere on the printer.

Safety Warnings

WARNING WITH THE POWER SWITCH IN THE OFF POSITION, POWER MAY STILL BE SUPPLIED TO THE PRINTER COMPONENTS. To completely cut power from the printer, you must unplug the power cords from the power outlets.

WARNUNG WENN DER NETZSCHALTER IN OFF POSITION STEHT, WIRD DEN KOMPONENTEN TROTZDEM STROM ZUGEFÜHRT. Um den Drucker komplett stromfrei zu machen, müssen Sie den Netzstecker ziehen.

WARNING The printer is too heavy to be lifted safely by one person. At least three persons are required to lift the printer.

WARNUNG Der Drucker ist zu schwer für eine Person. Mindestens 3 Personen sind erforderlich um den Drucker anzuheben.

WARNING THE PRINTER ELECTRONICS ASSEMBLY CONTAINS A LITHIUM BATTERY DEVICE. THERE IS A DANGER OF EXPLOSION IF THE BATTERY IS INCORRECTLY REPLACED. The battery must be replaced only by MacDermid ColorSpan authorized personnel, and must be replaced only with the same or equivalent type. Dispose of this lithium battery device in accordance with local, state (or province), and Federal (or country) solid waste requirements.

WARNUNG DIE ELEKTRONIK DES DRUCKERS ENTHÄLT EINE LITHIUM BATTERIE. ES BESTEHT EXPLOSIONSGEFAHR WENN DIESE UNSACHGEMÄSS AUSGEWECHSELT WIRD. Die Batterie darf nur durch einen MacDermid ColorSpan authorisierten Technicker ausgewechselt werden und muss mit dem gleichen oder einem gleichwertigen Typ Batterie ersetzt werden. Bitte entsorgen Sie die Lithium Batterie gemäss Ihren Landes- oder Bundesgesetzen.

WARNING	UV light hazard. The UV parking station must be installed during printing. Excess exposure to high-intensity UV light can result in photokeratitis (also known as snowblindness or welder's flash). AVOID LOOKING DIRECTLY AT THE UV LAMPS.

VORSICHT	UV Licht hoher Intensität. Bitte vermeiden Sie es, direkt in die Lampen zu schauen.

WARNING	Moving parts. Keep fingers away from the carriage and media path.

WARNUNG	Bewegliche Teile, Verletzungsgefahr.

Workflow Overview

Daily Startup

To daily ensure the functioning or substitution of all inkjets, and optimal output quality, follow this procedure:

1. Wake the printer from Sleep mode.
2. Remove the left-side parking station from the printer.
3. Select "Access Printheads" from the Front Page screen of the control panel.

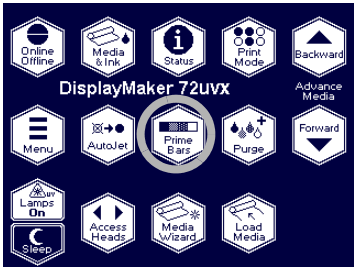
   The carriage moves to the left side, allowing access to the printhead jetting orifices.

4. Moisten a lint-free cleaning cloth with SolaChrome UV Printhead Flush solution.
5. Beginning with the #16 printhead, lightly dab (do not wipe) the printhead orifice plate with the moistened cleaning cloth, moving from the back of the printhead toward the front.
6. Repeat for each printhead, turning the cloth regularly and remoistening with head flush as necessary.
7. When all printheads have been cleaned, return the carriage to the right side of the printer by pressing the Proceed key on the control panel.

   The carriage moves back to its home position.

8. Reinstall the left-side parking station.

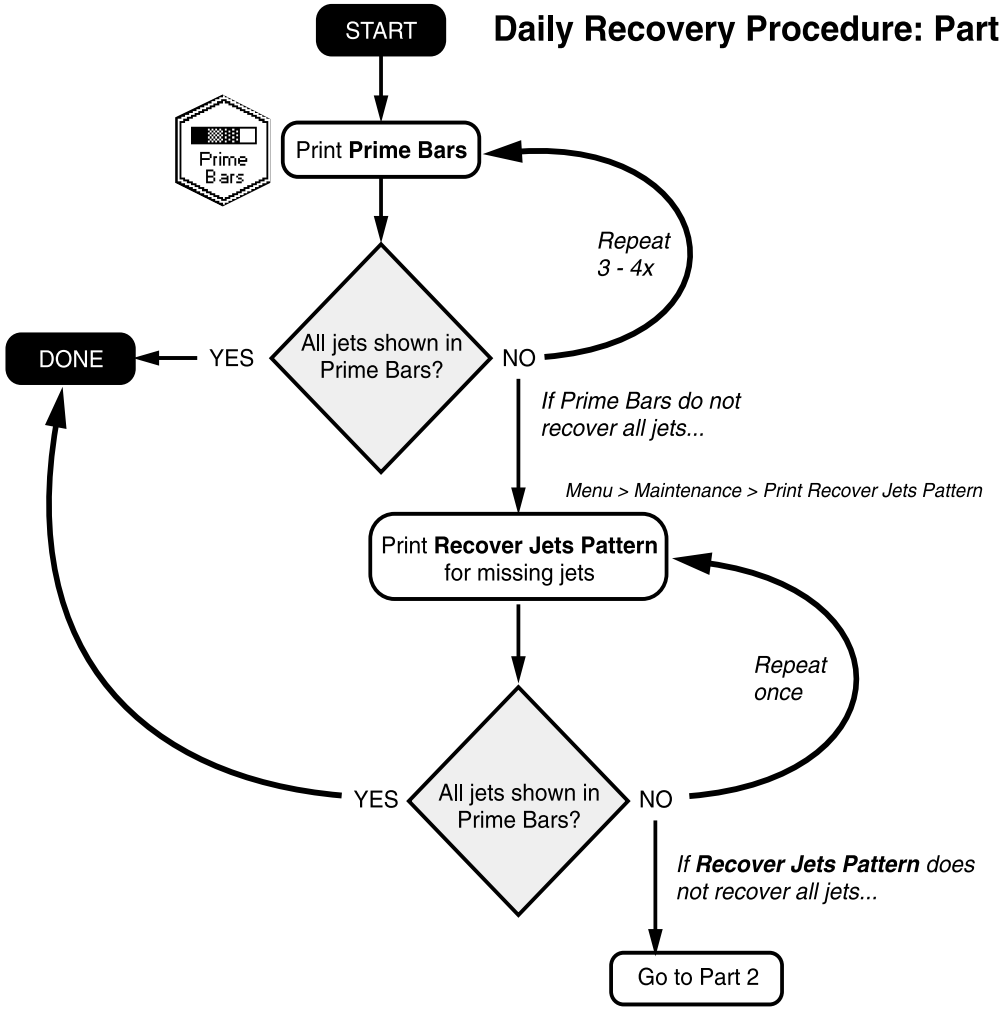
Recover Jets Part 1



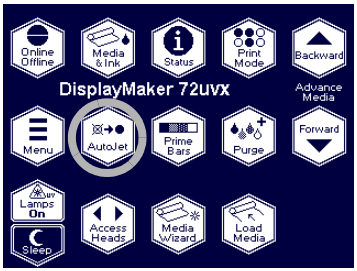
9. Print the **Prime Bars.**
   - If all jets (indicated by a printed line) are working, the printer is ready to print.
   - If there are any missing jets, print the **Prime Bars** again three or four times until all jets are working.
10. If any missing jets are present after printing the Prime Bars, print a **Recover Jets Pattern** (Menu > Maintenance > Print Recover Jets Pattern).

    This is a special pattern designed to recover missing inkjets. After printing this pattern, the prime bars are printed again.

    - If all jets (indicated by a printed line) are working, the printer is ready to print.
    - If there are any missing jets, print the **Recover Jets Pattern** one more time.


START
Daily Recovery Procedure: Part 1
Prime Bars
Print Prime Bars
Repeat 3 - 4x
All jets shown in Prime Bars?
YES
DONE
NO
If Prime Bars do not recover all jets...
Menu > Maintenance > Print Recover Jets Pattern
Print Recover Jets Pattern for missing jets
Repeat once
All jets shown in Prime Bars?
YES
NO
If Recover Jets Pattern does not recover all jets...
Go to Part 2

Recover Jets Part 2



11. If any missing jets are observed after printing the Recover Jets Pattern a second time, **Purge** the printheads.

    From the Front Page, press the **Purge** key, and purge the colors with missing jets. The control panel prompts you to remove the parking station so the carriage can be moved to the left side of the printer for purging.

12. Dab the printheads you purged with a lint-free cloth moistened with SolaChrome UV Printhead Flush.

    You may wish to wear gloves during this procedure to prevent staining your hands with ink. Do not use a paper towel or non-lint free cloth, or use a wiping motion, which could clog the inkjets.

13. Print the **Prime Bars.**

    - If all jets (indicated by a printed line) are working, the printer is ready to print.

14. If the **Prime Bars** show any missing jets, dab only the printheads that have missing jets:

    - Remove the parking station from the end of the printer.
    - From the Front Page, press the **Access Heads** key.
    - Dab or blot the printheads with a lint-free cloth moistened with SolaChrome UV Printhead Flush.
    - Press the **Access Heads** key again to return the carriage to the wiping station.
    - Reinstall the parking station and retaining pin.

15. Print the **Prime Bars.**

16. Print the **Recover Jets Pattern** for those printheads with missing jets.

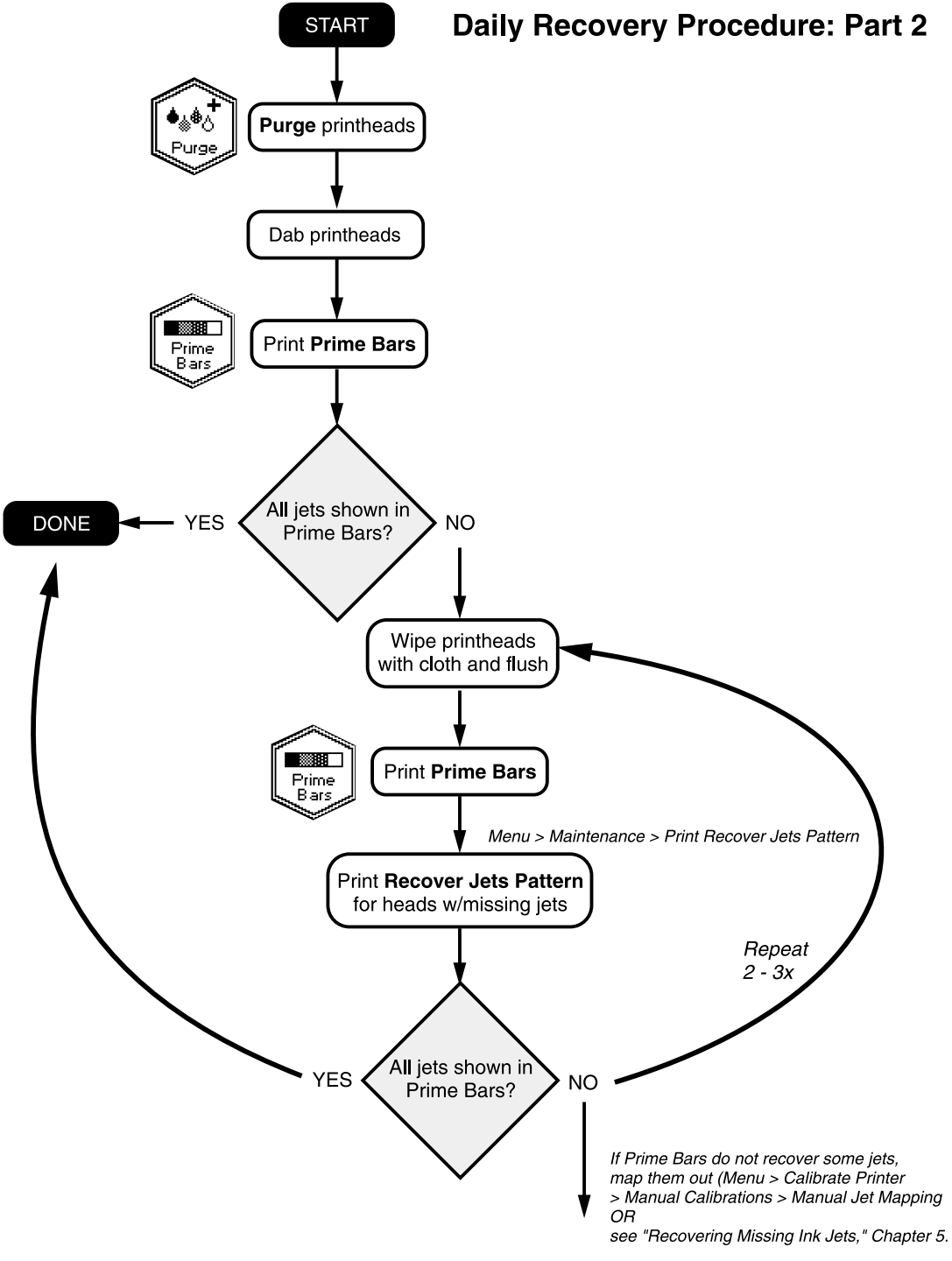
    After printing this pattern, the prime bars are printed again.

    - If all jets (indicated by a printed line) are working, the printer is ready to print.
    - If there are any missing jets, repeat steps 14 through 16 two or three times until all jets are working.

17. If the **Prime Bars** show any missing jets, map them out using the Manual Jet Mapping function (Menu > Calibrate Printer > Manual Calibrations > Manual Jet Mapping).

    Alternatively, you can attempt to recover the remaining missing jets. See “Recover Missing Ink Jets” on page 5-7 for instructions.

Daily Recovery Procedure: Part 2


START
Purge
Purge printheads
Dab printheads
Prime Bars
Print Prime Bars
All jets shown in Prime Bars?
YES
DONE
NO
Wipe printheads with cloth and flush
Prime Bars
Print Prime Bars
Menu > Maintenance > Print Recover Jets Pattern
Print Recover Jets Pattern for heads w/missing jets
Repeat 2 - 3x
All jets shown in Prime Bars?
YES
NO
If Prime Bars do not recover some jets, map them out (Menu > Calibrate Printer > Manual Calibrations > Manual Jet Mapping OR see "Recovering Missing Ink Jets," Chapter 5.

Printing

When the printer is connected to a ColorMark Pro print server, here is how a typical print job progresses from the client workstation to the printer. If you are using a non-ColorSpan RIP, refer to the documentation that accompanies it for details.

1. The operator sends a file to be printed from a client workstation.
2. The print job is received by the print server.

   Once it reaches the print server, the print job may be reprioritized, combined with other jobs, re-routed, or otherwise manipulated. Refer to the print server online help or manual for instructions.

3. The print server RIPs the job.

   The raster image processing (RIP) process translates the PostScript language data that comprises the print job into the data required by the printer.

4. The server sends the image to the printer for printing.

600x300 Printing

The default printing resolution is 600x600 dpi. To print a document at 600x300 dpi:

- Configure the third-party RIP or ColorSpan print server to rasterize print jobs at this resolution. Refer to the *Print Server & Driver Setup Guide* or third-party RIP documentation for instructions.
- Set the printer to **Production Quality Normal** print mode. In this mode, the printer will accept print jobs rasterized at either 600x600 or 600x300 dpi, and print them accordingly. If the printer receives a 600x300 dpi print job while set to another print mode, the job will be handled according to the option selected. See “Selecting a Print Mode” on page 3-5 for instructions.

Daily Shutdown

1. DO NOT POWER DOWN THE PRINTER.

The printer will automatically enter a Sleep mode when it has been idle for a user-defined period of time (see page 2-7 for details).

If the printer must be shipped or power removed for an extended period, see “Extended Power Down and Restart” on page 5-25 for instructions.

Parts Overview

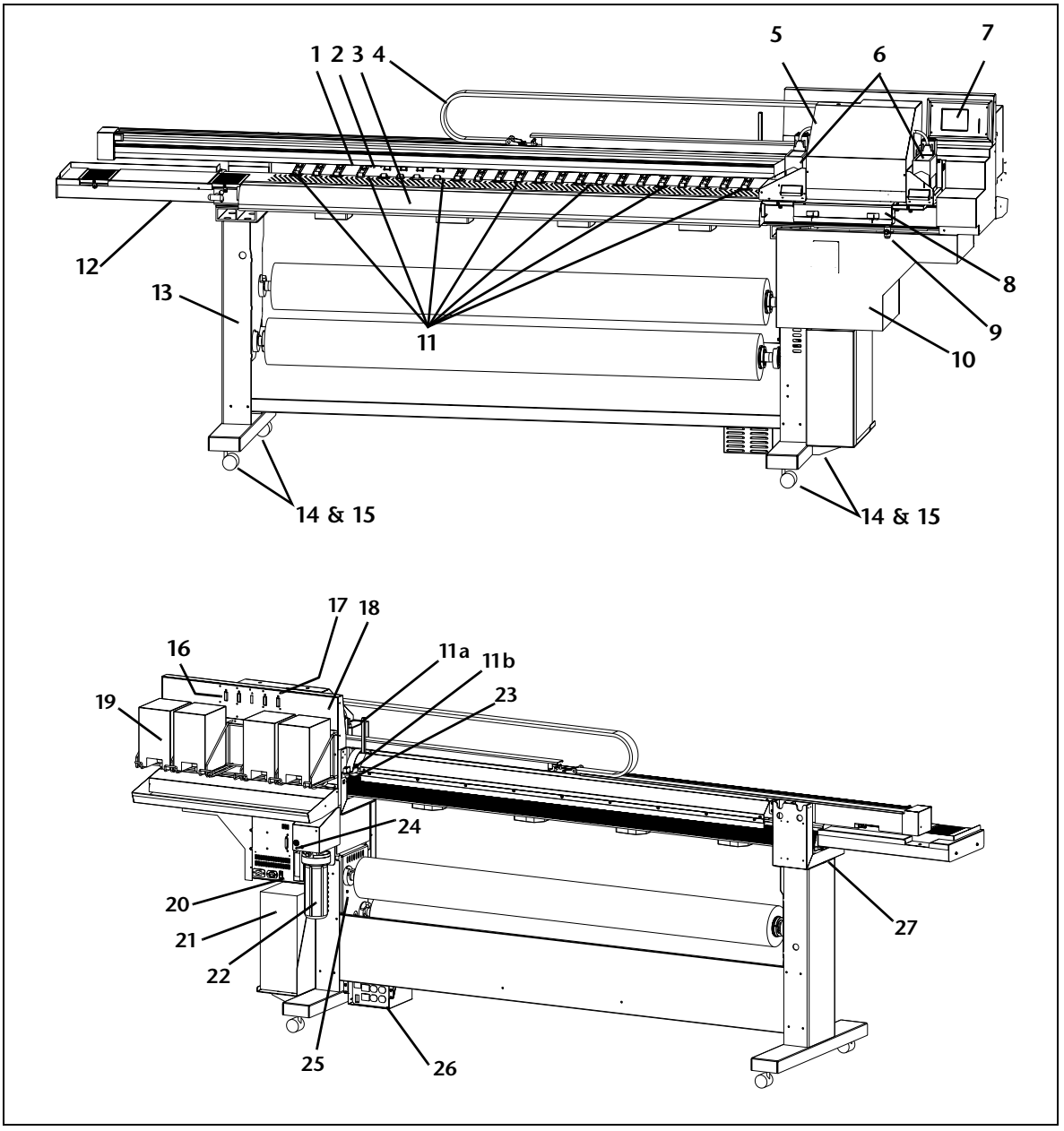


Fig. 1-1. Major parts of the printer

Index	Description
1	**Encoder strip** — allows precise positioning of the printhead carriage across the length of the platen.
2	**Main carriage drive belt** — moves the carriage across the length of the platen.
3	**Platen** — supports the media under the printheads during printing, warms the media in the print zone, includes vacuum to hold the media against the platen.
4	**Transport chain** — supports the ink supply tubes that carry ink from the ink boxes to the printheads, power, and electrical signal cables.
5	**Printhead carriage** — carries the printheads, digital imaging sensor, and photodiode across the length of the platen. **Digital image sensor (on carriage, not shown)** — detects the location of printed pixels for precise alignment of the printheads, enables the automatic replacement of poorly-printing inkjets with substitute jets. **Photodiode (on carriage, not shown)** — enables the linearization (calibration) of color transforms without an external device.
6	**UV cure lamps** — high-intensity lamps that cure the ink with ultraviolet light.
7	**Control panel** — displays messages and allows control of certain printer operations. Includes a contrast adjustment lever and audio feedback.
8	**Wiping station cover** — hinged at the front, remains closed during printing. Operator opens the cover during a Performance Purge. Can be raised and lowered to accommodate a wide range of media thicknesses (see
9	**Drain valve** — empties the wiping station of uncured ink.
10	**Electronics box** — contains the printer's power supply and control electronics.
11	**Pinch rollers (23 places)** — grip the media during loading and printing. The **pinch roller adjustment lever (11a)** allows you to adjust the force or release the pinch rollers to feed rigid cut-sheet media. A **media out sensor (11b)** detects whether media is loaded.

Index	Description
12	**UV parking station** — shields the operator from excess exposure to UV light. It must be installed during printing, but may be removed to access the printheads for cleaning.
13	**Stand** — supports the printer.
14	**Casters (four places) —** enables easy relocation of the printer, can be locked in place.
15	**Leveling pads (four places)** — allows the printer to be stabilized and leveled for consistent media feeding.
16	**Docking station** — holds the profilers, one for each box, that track ink and printhead flush usage, and identify ink characteristics for the RIP.
17	**Ready-for-Refill LEDs** — an LED illuminates when its corresponding profiler indicates that the ink box should be replaced with a full one.
18	**Off-Head System (OHS)** — electronics, vacuum (to maintain negative head pressure), and pressure (for purging the printheads) that provide ink and printhead flush for cleaning the printheads.
19	**Ink boxes** — each box holds ink or printhead flush. Flexible tubing connects to each box to deliver the contents to the printheads.
20	**Standby power switch —** places printer in standby mode (to disconnect from power, disconnect power cord).
21	**UV lamp power supply** — provides the UV lamps with power.
22	**Vacuum/Pressure (VP) assembly** — provides vacuum and pressure to the OHS and printheads.
23	**Media advance switch —** a rocker switch that advances the media forward or back.
24	**Auxiliary 24 volt power jack to VP system** — accepts the supplied 24 volt DC power supply to the VP system, which can be connected to a user-supplied UPS for temporary battery backup power or a wall outlet for temporary power during maintenance that requires the rest of the printer to be powered down. See Appendix A, Technical Specifications, for details.

Index	Description
25	**Media supply and takeup system** — drives and provides tension to the media supply and takeup spools. For printing on large rolls of narrow media, the 98-inch model includes spool support accessories (see page 3-15).
26	**Line conditioner** — prevents voltage fluctuations, line noise, and transient surges from reaching the UV power supply.
27	**Storage hook for light-blocking mat** — provides a convenient storage space for the light-blocking mat when not in use for 0.5 inch or thicker rigid media.
28	**Input and output roller tables for rigid media** — specially-designed roller tables support rigid media for precise media advance and best print quality. A second set of tables can be attached and clamped to the first set to support longer media. The tables can be easily connected to and removed from the printer as needed.

Special Features

The printer has many advanced features to help you produce the best printed output with the least effort.

Printheads

- **Micro-Quad™ printheads** — sixteen 600 dpi piezoelectric printheads (four per color).

Ink System

- **Off-Head System (OHS)** — 3 liter bulk ink boxes with profilers supply the printheads. The printer displays an alert when an ink box should be replaced.
- **Onboard vacuum/pressure (VP) system** — provides vacuum to maintain negative printhead pressure, and air pressure to purge the printheads or ink tubes without removing them from the printer.

Calibration

The Advanced Automation Eye uses a high-resolution imaging sensor, photodiode, and embedded software to align the printheads, detect and replace missing jets, linearize output, and color profile media.

- **AutoSet™ calibration** — uses a high-resolution digital imaging sensor to automatically align printheads bidirectionally for precise positioning of inkjet pixels, and runs AutoJet.
- **AutoJet™ calibration**— compensates for lost or misfiring jets by locating them and using substitute jets *without* slowing printing speed.
- **AutoTune™ scheduling** — runs AutoJet at user-defined intervals, for highest quality during unattended printing. Optionally, if unsubstituted non-working jets are found, printing stops until the problem is corrected.
- **Automatic color calibration** — uses an onboard photodiode to linearize output over the entire density range (with print server or RIP support).
- **Color profiling** — with print server or RIP support, the onboard photodiode can be used to create custom ColorMark® and ICC color profiles for third-party media.

Media Handling

- **Half-inch head height** — the printer can accept rigid sheet-fed media up to 0.5 inches (12.7 mm) thick. When switching between media less than 0.25 and greater than 0.25 inches thick, three simple adjustments are necessary for print quality and UV light blocking. See "Loading Rigid Media" on page 3-27 for instructions.
- **Media width sensing —** automatically detects the width and position of the media loaded, for precise image placement.
- **AutoEdge** — automatically aids the loading of rigid sheets by detecting the leading edge.
- **Rigid media roller tables** — specially-designed roller tables support rigid media for precise media advance and best print quality. Stabilizer bars ensure stable handling of heavy media. A second set of tables can be attached and clamped to the first set to support longer media. The tables can be easily connected to and removed from the printer as needed.
- **Steel media spools** — the takeup supports up to 7.5 inch (190 mm) diameter rolls of vinyl media on 3-inch cores. The supply can also accept 2-inch cores with the supplied 2-inch collets. On the 98-inch model, spool supports and a reinforcement sleeve support the weight of longer rolls of media less than 72 inches wide.
- **Tensioned roll-to-roll media handler** — tensioning is automatically maintained on the supply and takeup as the roll diameters change during printing. Optionally, the supply or takeup motors can be idled during printing. In roll-fed mode, the supply must be loaded, but the media can optionally be left off the takeup.

Performance and Ease-of-Use

- **Media Wizard** — stores and recalls a set of operating parameters by media type and print mode, for optimal printing performance. Includes a set of predefined settings for standard media; user may add settings for other media.
- **Speed/quality print modes** — provided to meet speed and quality requirements.
- **Edge-to-edge printing** — margins on rigid media can be set to zero for edge-to-edge printing, providing "full bleed" prints without trimming.
- **Fine Text Mode** — prints at half the normal head speed to improve the output quality of fine text and line art.
- **Sharp Edge Mode** — adds additional print passes and reduces print speed by 20% to reduce visible ink overspray at the edges of objects.
- **Simplified control panel interface** — Front Page screen presents frequently-used functions, with recommended preset configurations. A menu provides access to less-frequently used functions and troubleshooting help.
- **User assistance** — control panel features online help, interactive procedures, and diagnostics to assist the user "on-the-fly," reducing training and troubleshooting time.
- **Integrated Warning/Action system** — the **ATTN (Attention) key** blinks on the control panel when the printer detects an error condition, potential error condition, or when you make a change that suggests recalibration or other action to ensure best print quality.

CHAPTER 2

Using the Control Panel

This chapter describes the functions of the control panel.

- Overview (page 2-2)
- Front Page (page 2-4)
- Navigation Keys (page 2-9)
- Menu (page 2-10)
- Menu Tree (page 2-17)

Overview

The touch-screen control panel shows you the printer's current status, and enables you to interact with the printer when changing media and ink, respond to an error condition, or configure options. There are three main control panel screens:

- Ready (Status) Screen
- Front Page
- Menu

Ready Screen

When you press the Online/Offline button from the Front Page screen, the printer goes online and the Ready screen appears. The Ready screen displays the current status of the printer and any currently printing job. It displays when the printer is online (communicating with the print server) and either ready to print or printing.

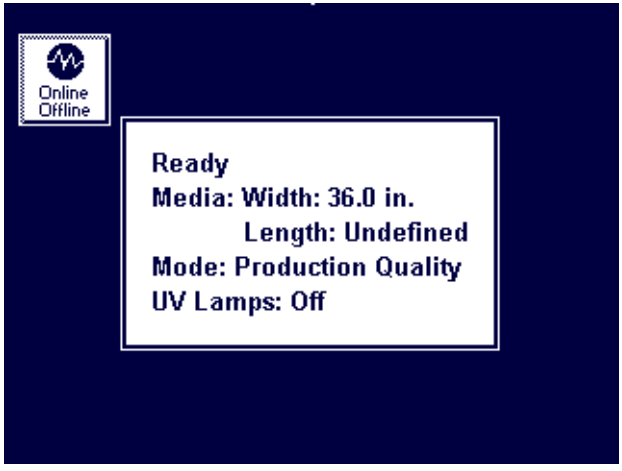


Fig. 2-1 Ready screen

Front Page

When you press the Online/Offline button from the Ready Screen, the printer goes offline and the Front Page screen appears. This screen is the top level of the printer's menu system. It provides access to the most frequently-used offline functions. For details, see "Front Page" on page 2-4.

Menu

When you press the Menu key on the Front Page screen, the Menu appears. The Menu provides access to advanced configuration options. For details, see "Menu" on page 2-10.

User Assistance

The control panel provides various forms of online user assistance:

The **? button** provides an explanation of the current function, with some guidance for what to do next.

The **ATTN (Attention) key** blinks on the control panel when the printer detects an error condition, potential error condition, or when you make a change that suggests recalibration or other action to ensure best print quality. There are two types of ATTN messages:

- **Actions** — the printer has detected an error condition that stopped printing or will prevent printing from starting. You must correct the error before the printer will be ready to print.
- **Warnings** — the printer has detected a condition that, if left unaddressed, could result in substandard prints or a condition that will require an action before printing can continue. Any action on your part is optional. Printing is not interrupted for a Warning message.

When the printer issues one of these messages, the ATTN key will blink, and an alert beep will sound (unless disabled, see page 2-13). Press the ATTN key to display a list of message titles, and select a title to display a detailed cause-and-recovery screen. The table beginning on page B-10 also lists these messages and recovery procedures.

If you choose to not correct a Warning condition and resume printing, the ATTN key will remain displayed, but will not blink until the printer issues a new Warning or Action message. The messages can be dismissed by correcting the condition, or by pressing the applicable key on the detail screen.

Tip To disable the ATTN key, see page 2-13 for instructions on choosing Expert mode. Expert mode routes most messages to an Actions & Warnings menu option.

Front Page

The Front Page provides access to the most frequently-used printing and maintenance functions. For advanced configuration options, press the Menu key (see “Menu” on page 2-10 for instructions).

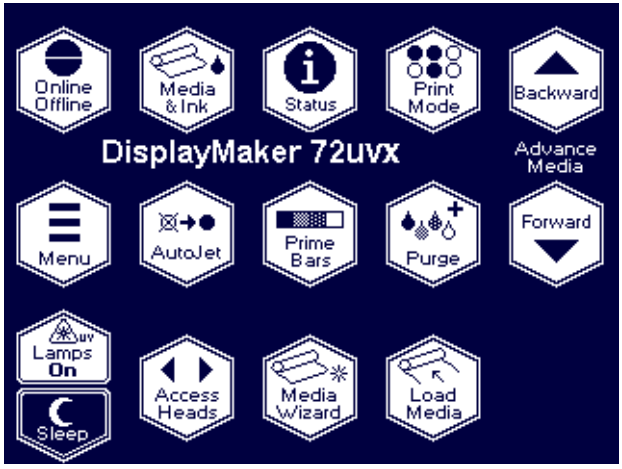


Fig. 2-2. Front Page

- **Printer Name** — displays the name of the printer as defined on the print server or under the menu at **Printer Settings > Printer Name.**
- **Online/Offline** — returns the printer to the Ready screen, when it is online and ready to receive print jobs.

- **Media & Ink** — displays a listing of the media and ink currently installed in the printer. Press the ▼ and ▲ keys to highlight "Media" or one of the inks, then press ▶ (Proceed) to display information about the selection. From this screen, you can press the ⬅ and ➡ keys to scroll between screens. Press ▶ (Proceed) to return to the list, then ↩ (Menu Out) to display the Front Page screen.

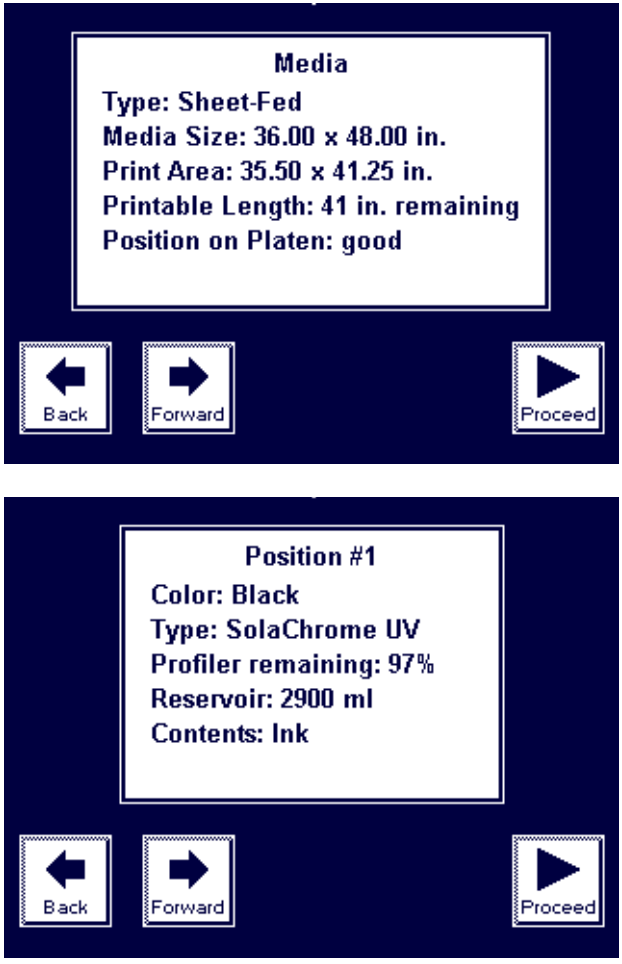


Fig. 2-3. Media Info, Ink Info screens

- **Status** — displays system parameters and the status of all user-configurable options. Press the ⬅ and ➡ keys to scroll between pages. To change an option, go to the Printer Configuration section of the menu.

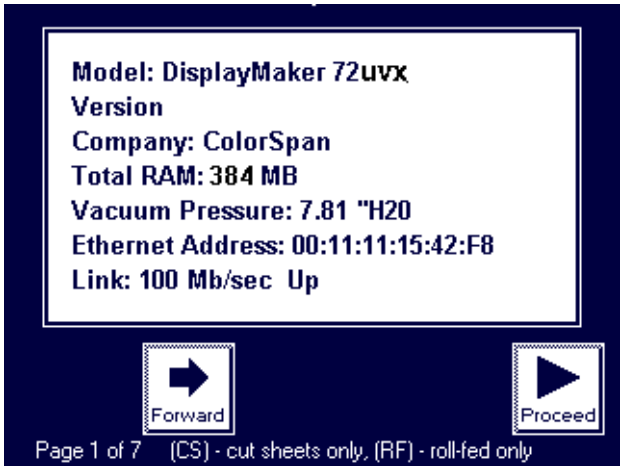


Fig. 2-4. Status page 1

- **Print Mode** — sets print quality mode. See "Selecting a Print Mode" on page 3-5 for instructions.
- **Advance Media** — press the ⮟ key to advance the media forward. When you press and hold the ⮟ key, the media moves faster. Press the ⮝ key to reverse the media back onto the supply spool. When you press and hold the ⮝ key, the media moves faster. You can also press the Media Advance rocker switch, located between the inks and the platen, to move the media in either direction.
- **Menu** — displays the complete printer menu for access to advanced configuration options (see "Menu" on page 2-10 for instructions).
- **AutoJet** — detects deflected and non-firing jets, and substitutes working jets for them (in Production and High Quality modes, not available in Billboard mode.).
- **Prime Bars** — fires all jets by drawing a set of lines called prime bars. This is a good way to inspect and prepare the jets for printing after they have been idle (see "Print Prime Bars" on page 3-9). You can also print a similar pattern called Print Jet-Out Lines, which shows which jets have been detected and replaced by AutoJet (see page 2-11 for details).

- **Purge** — purges the printheads on the left side of the printer, to help recover missing jets. Follow a purge with a manual dab or blot of the printheads (do not wipe) with a lint-free cloth.
- **Lamps On/Off** — allows you to manually power on or off the lamps, instead of waiting for automatic operation.
- **Sleep/Wake** — **Sleep** detensions the takeup system (roll-fed media), and powers down the UV lamps, printheads, carriage, and media drive motors, but maintains vacuum to the printheads to prevent ink leakage. **Wake** tensions the takeup system and powers up the printer components. The printer goes into sleep mode automatically after 30 minutes, and "wakes" automatically when a print job is received or a printer operation is performed from the control panel.

  In Sleep Mode, the carriage moves 0.25 inches (6 mm) once per hour for three hours, then moves in the other direction for three hours, and repeats this sequence until the printer is restored from Sleep Mode. This prevents the formation of a flat spot on the carriage bearings (wheels) when the printer is in Sleep Mode for over 24 hours.

Caution If printhead vacuum is lost during Sleep Mode, ink will begin to seep from the printheads.

To prevent ink leakage during an unexpected power outage, MacDermid ColorSpan strongly recommends using the vacuum/pressure system's 24 volt auxiliary power supply and connecting it to an uninterruptable power supply (UPS). Affordable and reliable UPS units are available with 100-240 VAC, 50/60 Hz, minimum of 15 watts. See Appendix A for details. It is not necessary to connect the entire printer to a UPS, only the vacuum/pressure system needs to be connected to avoid ink seepage.

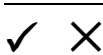
- **Access Heads** — moves the printhead carriage out from the service station to the opposite end of the printer. This is the same functionality as the Access Printheads option on the Maintenance menu. The UV parking station must be removed first to avoid the possibility of the carriage striking it.
- **Media Wizard** — provides direct access to the printing parameters stored for the currently loaded media (see "Media Wizard" on page 3-41 for details).
- **Load** (visible when the supply and takeup are unloaded) — loads roll-fed or sheet-fed media. See "Loading Roll-Fed

Media" on page 3-14, or "Loading Rigid Media" on page 3-27 for instructions.

- **Unload** (visible when the supply and takeup are loaded) — detensions and enables you to unload the supply and takeup system. See "Unloading and Cutting Roll-Fed Media" on page 3-21 for instructions.
- **Reload** — enables you to load another roll or sheet of the previously printed media with the same settings, without stepping through the media load process.
- **ATTN** (Attention)— blinks on the control panel when the printer detects an error condition, potential error condition, or when you make a change that requires recalibration or other action to ensure best print quality. See "User Assistance" on page 2-3 for details.

Navigation Keys

The following table shows you how to move through the menu system and perform printer control functions.

Key	Description
	Display Menu — displays the printer menu.
	Menu Up/Down — moves the menu highlight up and down the menu.
	Menu Top/Bottom — moves the menu highlight to the top or bottom for the menu.
	Menu Out — moves to the next higher menu in the hierarchy.
	Menu In — selects the highlighted menu option.
	Back/Forward — moves between pages or screens, or selects between other options.
	Proceed — initiates the selected function.
	Help — displays a summary description of the highlighted menu options.
	Pause/Resume — pauses or resumes printing during a calibration.
	Cancel — cancels the current menu function or choice.
	**Yes/No** — indicates a Yes or No.
	Continue (error screen) — proceeds to the next step in a troubleshooting dialog.
	Ignore (error screen) — specifies “ignore” in a troubleshooting dialog.
	Retry (error screen) — specifies “retry” in a troubleshooting dialog.
	Reboot Printer (error screen) — specifies “restart printer” in a troubleshooting dialog.
	Information (error screen) — displays further information about the error.

Menu

The menu has these main sections:

- Calibrate Printer (see below)
- Printer Settings (page 2-11)
- Maintenance (page 2-15)
- Service Printer (page 2-16)
- User Diagnostics (page 2-16)
- Warnings & Actions (page 2-16), shown in Expert Messages Mode only
- Print Menu Tree (page 2-16)

This section explains each of the functions on the printer menu. See "Menu Tree" on page 2-17 for a listing of all menu options.

Calibrate Printer

For instructions on using these options, see Chapter 4, Calibrating the Printer.

- **Auto Calibrations** — see "Auto Calibrations" on page 4-6 for instructions.
  - Auto Bidi Calibration — ensures that every working jet fires a pixel at precisely the same location, in both directions of travel
  - Auto H2H Calibration — aligns the printheads relative to each other
  - AutoJet Calibration — locates and substitutes missing jets for working jets
  - Full AutoSet — runs AutoJet, AutoBiDi, and AutoH2H in sequence

- **Manual Calibrations** — allows you to calibrate the printer visually, without the printer's digital imaging sensor. Inaccurate judgments by the operator during these tests could result in substandard output. See "Manual Calibrations" on page 4-8 for instructions.
  - Media Feed
  - Manual Bidi Registration
  - Manual X Head Registration
  - Manual Jet Mapping — the manual version of AutoJet
  - Jet Status Lines — prints the Manual Jet Mapping pattern without running the calibration
  - Print Jet-Out Lines — prints a version of the prime bars (see page page 2-6), in which missing jets that are replaced are marked with a black square.
  - Default Registration Data
- **AutoTune** (roll-fed media only) — schedules jet maintenance to run automatically after a certain number of prints have printed. See "AutoTune" on page 4-4 for instructions.
- **Calibration Summary —** prints summary information with the AutoSet calibration test patterns, or transmits registration or jet data to a log file on the print server. See "Calibration Summary" on page 4-25 for details.
- **Configure for Profile Creation** (cut sheet printing only) — causes all calibration prints to print on the same cut sheet, rather than ejecting the sheet after each calibration print. Automatically disabled after all calibration prints are finished, when a print job is received from the RIP, or when roll-fed media is loaded. The user can specify a dry time delay after which the linearization will begin.

Printer Settings

Printer Settings enables you to set many options that control how the printer operates. Settings saved by the Media Wizard are indicated by ***MEDIA WIZARD*** in the margin.

MEDIA WIZARD
- **Takeup Tension** — adjusts the media takeup tension, which is required for proper media feeding. Insufficient takeup tension could result in inaccurate media feed and media buckling.

MEDIA WIZARD
- **Supply Tension** (72UVX) — adjusts the media supply tension, which is required for proper media feeding. The lowest ("idle") tension is best for most media. (The 98UVX supply tension is always idle.)

- **Supply Out Detection** (98UVX) — reports when the supply spool stops rotating, indicating that there is no more media. This setting is also available on the 72UVX when the **Supply Tension** option is set to idle.

MEDIA WIZARD

- **Platen Vacuum Control** — turns on the vacuum fans, then allows you to raise or lower the fan speed. Raise the speed if the media is rising off the platen, lower the speed if the media is buckling or wrinkling. Turn off the vacuum for lightweight media such as paper or fabrics.

MEDIA WIZARD

- **Printing Delay** — slows throughput (media advance speed) to allow the media to cool between passes, preventing curling of rigid media.

MEDIA WIZARD

- **Media Out Sensor** — enables you to disable the media out sensor if it is malfunctioning, or enable it after it has been replaced.
- **Gutter Settings** — determines the appearance of the top and side gutters:
  - Top Gutters — allows you to turn **On** or **Off** the gutter data at the top edge of the print, which shows the job name, ink, media, date and time printed, print mode, lamps setting, printer, embedded software version, plus write-in blanks for other data.
  - Side Gutters — sets the side gutter pattern to **Narrow**, **Medium**, or **Wide** sizes, or turns them **Off**. Side gutter patterns help keep the inkjets open by firing ink through them in a pattern outside the printed image area.
- **Margin Settings**
  - Space Between Prints (roll-fed) — sets the blank space between print jobs, between 0 and 10 inches (25 cm).
  - Right and Left Margin — sets the amount of blank space for the right and left margins, between 0.25 and 5 inches (6-127 mm) for roll-fed media, and between 0 and 5 inches (0-127 mm) for cut-sheed media.

    When you set the right and left margins to zero (edge-to-edge printing on cut-sheet media), the printer prompts you for an **Overprint** value. This is the distance beyond the edge of the media to print, to help avoid a blank strip if the sheet is slightly skewed, not perfectly rectangular, or other error is present. Apply tape to the platen at the edge of the media to catch the overprinted ink. For further information on edge-to-edge printing, see "Edge-to-Edge Printing" on page 3-35.
  - Leading Margin — defines the margin on the leading edge of cut-sheet media.

- Trailing Margin — defines the margins on the trailing edge of cut-sheet media.

Note If you load roll-fed media, the printer automatically resets the margins to 0.25 inches (6 mm).

- **Measure Media Type** — for cut-sheet media, you can choose one of three levels of precision for finding the left, right, and front edges of the media.
  - Minimal — measures the width of the media once, and finds the front right edge
  - Standard — measures the width of the media once, and finds the right and left front edges to estimate skew
  - Maximal — measures the width of the media in two places to estimate skew

  Choose Minimal for fastest throughput, Maximal for greatest precision and skew detection when printing edge-to-edge.
- **Quality Check** — determines how AutoTune errors are handled (see page 4-4).
- **Print Position** — when the printed image does not span the entire width of the media, positions the printed image flush right (nearest the control panel), flush left, or centered on the media.

MEDIA WIZARD

- **Stiff Roll-Fed Media Handling** — when enabled, detensions then retensions the takeup system before every print job, for more accurate feeding of adhesive-backed and other stiffer roll-fed media types.
- **Sleep Wait Time** — sets the period of time to wait for a print job before going into Sleep mode (see page 2-7).
- **Expert/Novice Messages** — **Novice** mode presents an ATTN (Attention) key with Warnings (alerts that do not prohibit printing) and Actions (conditions that require user intervention before printing can proceed). **Expert** mode presents Actions only, presents fewer "press Proceed" prompts after an Action has been addressed. The default is Novice mode.

  When in Expert mode, active Warnings and Actions can be displayed by selecting **Warnings & Actions** from the menu, since Warnings will not cause the ATTN key to appear in Expert mode. See "User Assistance" on page 2-3 for further information about Actions and Warnings.
- **Audible Alarm** — enables and disables the audible alarm beep that sounds with Warning and Action messages.

- **Localization** — sets **English** or **Metric** units of measure, and time and date formats, for data displayed by the control panel.
- **Head Height** — moves the printhead carriage over the platen so you can adjust the head height. See "Set the Printhead Height" on page 5-11 for instructions.
- **Wiping Position** — allows you to center the carriage over the service station for best wiping.
- **Automatic Eject** (cut sheet printing only) — when enabled, the sheet is automatically ejected at the end of the print job. When disabled, the next job(s) will print on the same sheet until there is no more room to print.
- **Low Ink Warning** — defines the amount of ink remaining in the ink box supply at which the printer will display a "low ink" message on the control panel.
- **UV Lamps Idle Time** — sets the amount of time the lamps will stay on after printing before they are automatically turned off by the printer. The idle time can be set from 1 to 10 minutes. Increase the idle time if you are printing several jobs and waiting for the lamps to warm up between prints, decrease the idle time if printing single jobs.
- **UV Lamps Warm-Up Time** — if both UV lamps have not warmed up completely when the first print begins printing, printing anomolies are likely to occur due to insufficiently-cured ink. This option allows you to extend the warm-up period to ensure that both lamps have warmed up enough to cure the ink completely. The current warm-up period is displayed on the Front Page printer status pages.
- **Printer Name** — displays a keypad to change the printer name displayed on the control panel and RIP or ColorSpan Print Server.
- **Restore All Defaults** — restores all Printer Configuration settings to their factory default values, and zeroes all registration data. After running this option, all calibration values must be reestablished by running AutoSet or manual calibrations.

Maintenance

- **Access Printheads** — moves the carriage to the left side of the printer. Remove the UV light shield before selecting this option, to avoid the possibility of the carriage striking it.
- **Perform An Air Purge** — purges the printheads with air. Select **Standard** to clear most jet-outs, or **Performance** to clear stubborn jet-outs (expels more ink).
- **Print Recover Jets Pattern** — prints a special pattern designed to recover missing inkjets. After printing this pattern, the prime bars are printed.
- **Print Jet-Out Lines** — prints a version of the prime bars (see page 2-6), in which missing jets that are replaced are marked with a black square.
- **Print Media Skew Lines** — prints a swath of parallel lines across the width of the media, in alternating directions, continuously until you stop the print. If the swaths are not parallel to each other, the media is skewed (not feeding straight). If there is a noticeable space between swaths, or if they overlap, the media advance should be calibrated.
- **Reset Reservoir Filters** — after you replace the filters, select this option to reset the ink counts to zero. See "Replace Ink Filters" on page 5-16 for instructions.
- **Reset UV Lamp Hours** — resets the lamp's elapsed operating time clock to zero. The printer displays a warning message when the UV lamps have been in service for a certain period. They should be replaced when they are no longer curing the ink. To view the total operating time for each lamp, press the **Status** key on the Front Page, and advance to the page where this is listed.
- **Respool Media** — respools media from the supply directly to the takeup (in either direction) without passing over the platen.
- **Clean Grit Rollers** — advances the grit rollers continuously so they can be cleaned (with no media loaded).
- **Printheads Procedures** — see "Printhead Procedures" on page 5-24, for instructions on using the following options:
  - Load Ink in All Heads — fills empty printheads with ink.
  - Fill Heads with Ink — fills the printheads with ink.
  - Empty Heads (Fill With Air) — fills the printheads with air.

Service Printer

These tests are for factory, service, and technical support use.

User Diagnostics

User Diagnostics presents an interactive troubleshooting program to diagnose problems before calling MacDermid ColorSpan Technical Services. It walks you through a series of tests and checks for certain printer functions. The printer asks you to make observations or run simple tests to help it diagnose problems and suggest corrective actions. It has the following sections:

- **Printhead Jet Statistics**
- **VideoNet Status**
- **VideoNet Connection**
- **Carriage Motion**
- **Calibration**
- **Vacuum Pressure**
- **Warnings and Actions List** — table of all actions and warnings with cause and recovery. This is an abbreviated version of the table "Action and Warning Messages" on page B-10.
- **Error History**
- **Log Error History**

Warnings & Actions

When in Expert mode, any current Warning, Change, and Action messages can be displayed by selecting **Warnings & Actions** from the menu. When in Novice mode, press the ATTN icon on the Front Page screen to view these messages.

See "User Assistance" on page 2-3 for further information about Actions and Warnings, and the table beginning on page B-10 for a list of recovery procedures.

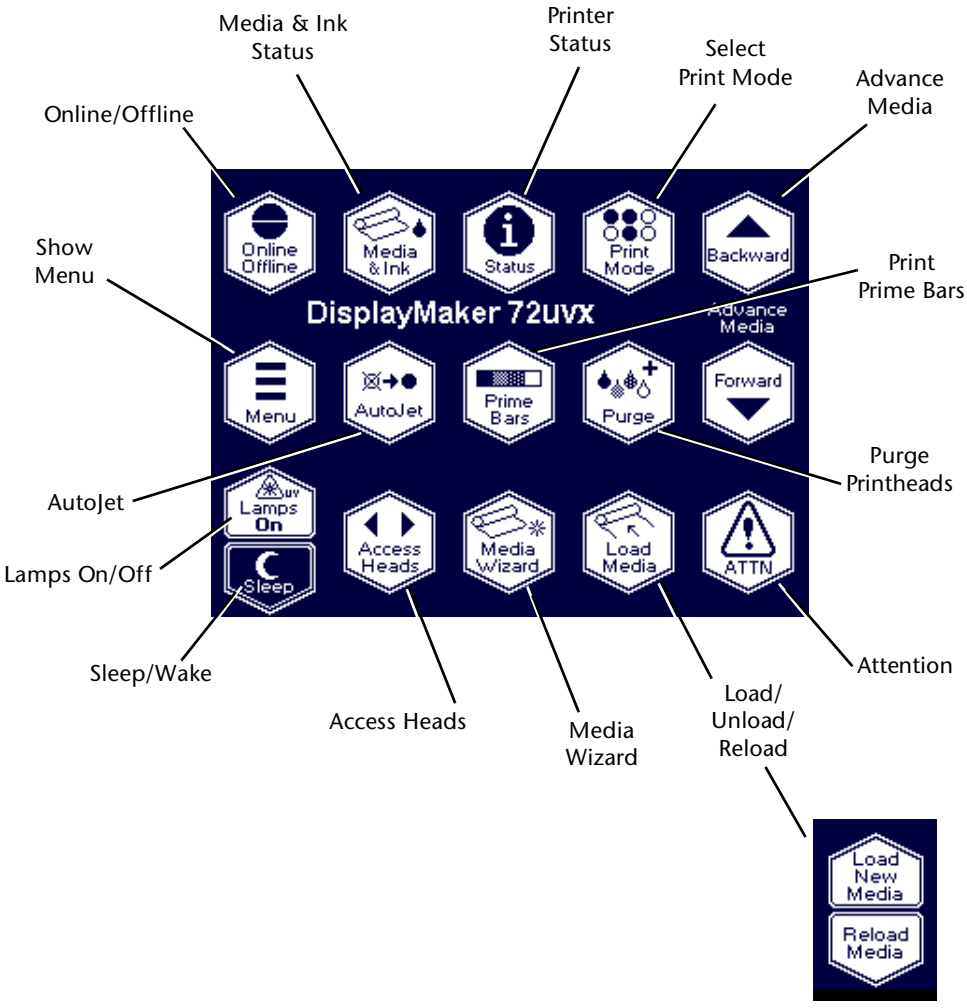
See page 2-13 for a description of the Expert/Novice Messages mode.

Print Menu Tree

This option prints all of the menu options in a hierarchical tree format.

Menu Tree

Front Page



Menu

This menu tree reflects version 1.34 of the embedded printer software. Refer to the *Release Notes* for more recent versions. Options shown in *italics* are dynamically hidden depending on the printer mode.

Calibrate Printer
- Auto Calibrations
  - AutoBidi Calibration
  - AutoH2H Calibration
  - AutoJet Calibration
  - Full AutoSet
- Manual Calibrations
  - Media Feed
  - Manual Bidi Registration
  - Manual X Head Registration
  - Manual Jet Mapping
  - Jet Status Lines
  - Print Jet-Out Lines
  - Default Registration Data
- *AutoTune* (Roll-Fed media only)
- Calibration Summary
  - AutoSet Summary
  - Log Head Registration Data
  - Log Jet Data
- *Configure for Profile Creation* (Cut-Sheet media only)

Printer Settings
- Takeup Tension
- *Supply Tension* (72UVX)
- *Supply Out Detection* (98UVX)
- Platen Vacuum Control
- Printing Delay
- Media Out Sensor
- Gutter Settings
  - Top Gutters
  - Side Gutters
- Margin Settings
  - Space Between Prints
  - Right and Left Margin
  - Leading Margin
  - Trailing Margin
- Media Measure Type
- Quality Check
- Print Position
- Stiff Roll-Fed Media Handling
- Sleep Wait Time
- Expert/Novice Messages
- Audible Alarm
- Localization (*was "Units"*)
  - Units of Measure
  - Time Format
  - Date Format
- Head Height
- Wiping Position
- Automatic Eject
- Low Ink Warning
- UV Lamps Idle Time
- UV Lamps Warm-Up Time
- Printer Name
- Restore All Defaults

Maintenance
- Access Printheads
- Perform An Air Purge
- Print Recover Jets Pattern
- Print Jet-Out Lines
- Print Media Skew Lines
- Reset Resevoir Filters
- Reset UV Lamp Hours
- Respool Media
- Clean Grit Rollers
- Printheads Procedures
  - Load Ink In All Heads
  - Fill Heads with Ink
  - Empty Heads (Fill with Air)

Service Printer
- Device Tests
- Print Tests
- Ink System Tests
- Home Head
- Measure Media Width
- Tension Supply & Takeup
- Measure Platen Width
- Zero Platen Width
- Printhead Y Calibration
- Image Sensor Calibration
- Media Thickness Calibration
- Configure Warning Attns
- Drip-Through Service Cover
- Carriage Control
- Print Info Pages

User Diagnostics
- Printhead Jet Statistics
- VideoNet Status
- VideoNet Connection
- Carriage Motion
- Calibration
- Vacuum Pressure
- Warnings and Actions List
- Error History
- Log Error History

Warnings & Actions **(Expert Mode only)**

Print Menu Tree

CHAPTER 3

Ink and Media

This chapter describes how to use ink and media with the printer:

- Ink
  - Ink System Overview (page 3-3)
  - UV Lamp Overview (page 3-4)
  - Selecting a Print Mode (page 3-6)
  - Checking Jet Health (page 3-10)
  - Loading Ink (page 3-12)
- Media
  - Loading Roll-Fed Media (page 3-15)
  - Unloading and Cutting Roll-Fed Media (page 3-22)
  - Respooling Media (page 3-24)
  - Printing Tips (page 3-26)
  - Using the Media Tables (page 3-27)
  - Loading Rigid Media (page 3-28)
  - Unloading and Reloading Rigid Media (page 3-35)
  - Edge-to-Edge Printing (page 3-36)
  - Media Wizard (page 3-42)

Ink System Overview

The printer's ink system consists of the following components:

- **Ink boxes** — bag-in-box supply of UV cure ink, suitable for both flexible and rigid media applications.

Note Unlike other inks used in wide format printing, UV cure ink has a limited shelf life. Plan to rotate your ink stock and use it promptly by the date printed on the ink box.

- **SolaChrome UV Printhead Flush** — used to moisten the lint-free cloth or wiper tool for cleaning the printheads, also in automated flushing of the printheads. It has no properties that work against the ink to soften or reliquify cured ink, or any other similar cleaning properties. It does not react with the ink, making it suitable for use as a lubricating agent for cleaning.

Caution Use only genuine SolaChrome UV inks and Printhead Flush in the printer. Use of any other inks or cleaning fluids COULD DAMAGE THE PRINTER AND WILL VOID THE WARRANTY.

- **Profilers** — provided with each ink box, they contain information about the ink and must be installed together with their corresponding box. Profiler data are used to track ink levels, and to help ensure optimal output quality and compatibility with printer components.
- **LEDs** — the LED next to each profiler illuminates when the box is almost empty, to alert the operator to exchange the box for a full one. The LED above a box will also blink when there is an Attention message associated with that color.
- **Ink tubes** — carry ink to the printheads, they are opaque to prevent ink curing before printing.
- **Printheads —** permanent piezo-based printheads.
- **Vacuum/Pressure (VP) System** — provides vacuum to maintain negative pressure at the printheads, and pressure to purge the ink tubes and printheads.
- **UV lamps** — provide the high-intensity ultraviolet light required to cure the ink.

UV Lamp Overview

The printer's two UV lamps (on the left and right sides of the printhead carriage) emit the high-intensity ultraviolet light that is necessary to cure the UV ink.

The lamps require a separate power supply from the printer, to light the lamps and ensure adequate curing. They have a limited life, during which the amount of UV light emitted slowly decreases, eventually reaching a level that will no longer cure the ink. There are measures you can take to extend the service life of the lamps, but they will eventually have to be replaced.

You should be aware of the following characteristics of these lamps when operating the printer:

WARNING UV light hazard. The UV parking station must be installed during printing. Excess exposure to high-intensity UV light can result in photokeratitis (also known as snowblindness or welder's flash). AVOID LOOKING DIRECTLY AT THE UV LAMPS.

VORSICHT UV Licht hoher Intensität. Bitte vermeiden Sie es, direkt in die Lampen zu schauen.

- **UV light exposure** — the printer is designed with shields, louvers, and other features to protect the operator from exposing the eyes and skin to high levels of UV radiation. The printer must be operated with the UV parking station installed. Do not look directly at the UV light.
- **High/low lamp operation** — the UV lamps are operated at high intensity only when curing the ink. When the carriage is not directly over the media, the lamps are switched to a lower intensity.
- **Warm-up/cool down cycle** — the UV lamps take about one minute to warm up to operating temperature, and about three minutes to cool down fully. After printing, the lamps must fully complete their controlled cool-down cycle before warming up again for the next print job (for a total elapsed time of about four minutes).

  To save time, you can manually switch on or off the lamps on the Front Page screen of the control panel (see "Front Page" on page 2-4).

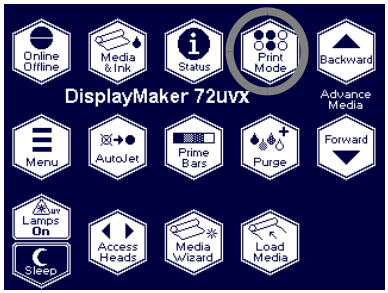
Caution **Do not switch off the UV lamp power supply unless the lamps have fully completed their controlled cool-down cycle** (with fans and heat extraction). Removing power from hot lamps can result in overheating and permanent damage. If sudden removal of power occurs, contact ColorSpan Technical Services before starting the printer again.

- **Lamp replacement** — the UV lamps will gradually lose their intensity and therefore their ability to cure the ink. See "Replacing UV Lamp Bulbs" on page 5-20 or the instructions included with replacement parts for details.
- **Unidirectional printing** — when printing for long periods in one direction (unidirectionally), the curing ability of the lamps will become unbalanced, which could result in insufficient curing or printing anomolies. To avoid this, occasionally switch between Unidirectional Left and Unidirectional Right printing (see "Selecting a Print Mode" on page 3-6).

Selecting a Print Mode

The printer can print in several different modes for the combination of quality, resolution, and speed that you require.

Mode	Maximum Speed (bidirectional printing) @ 72 inches wide	Jet Replacement
Billboard Quality	400 ft² (37.2 m²)/ hour	None
Production Quality		Standard
with 600x600 dpi jobs		
Normal	200 ft² (18.6 m²)/ hour	
Fine Text	100 ft² (9.3 m²)/ hour	
Sharp Edge	160 ft² (14.9 m²)/ hour	
with 600x300 dpi jobs (requires 600x300-specific color profiles and file from RIP)	400 ft² (37.2 m²)/ hour	
High Quality		Maximum
Normal	100 ft² (9.3 m²)/ hour	
Fine Text	50 ft² (4.6 m²)/ hour	
Sharp Edge	80 ft² (7.4 m²)/ hour	



1. On the Front Page screen of the control panel, press the **Print Mode** key.

   The print mode menu appears, with these options:

   - Billboard Quality
   - Production Quality
   - High Quality

   Jet replacement refers to the printer's ability to locate and replace inkjets that are clogged or misfiring. High Quality mode has the best jet replacement, Billboard Quality mode has the highest speed.

2. Press the ▲ and ▼ and keys to highlight a print mode.
3. Press the ✓ (Set) key to select the print mode.

   A menu appears with these options:

   - Bidirectional
   - Unidirectional Left
   - Unidirectional Right

The printer can print in both directions (**bidirectional**) or in one direction only (**unidirectional**). Unidirectional printing can occur in either direction. Printing occurs at about half the speed of the corresponding bidirectional print mode. Unidirectional printing eliminates the bidirectional misalignment that occurs when printing on media that is not perfectly flat.

4. Press the ▲ and ▼ and keys to highlight a direction.
5. Press the ✓ (Set) key to select the direction.

   In Production and High Quality modes, a menu appears with these options:

   - **Normal** — prints at full speed.
   - **Sharp Edge** — improves the appearance at the edges of larger text, colored borders, graphics, and images by directing the inkjet overspray into the printed area. This mode requires an additional print pass than Normal mode.
   - **Fine Text** — prints at half the normal head speed to improve the output quality of fine text and line art by eliminating overspray.

Caution Printing in **Fine Text** mode, which prints at 50% of the speed of the "normal" Production and High Quality modes, may expose the media to excessive heat from the UV lamps, which could result in bowing of the center of the medi, and possible contact with the printheads. Thinner rigid media such as fluted polypropylene (Coroplast) are susceptible. To avoid warping, set a media delay in **Printer Settings > Printing Delay,** or in a custom Media Wizard parameter set for Fine Text printing.

This could also be an issue with **Sharp Edge** printing, although this mode prints at 80% speed, so it is less susceptible to excessive heat buildup.

6. Press the ▲ and ▼ and keys to highlight an option.
7. Press the ✓ (Set) key to select the option.

   In Production Quality Normal mode, the printer will accept and print jobs rasterized at either 600x600 dpi or 600x300 dpi.

In all other modes, 600x300 dpi printing is not supported. When these modes are selected, the 600x300 handling options appear:

- **Prompt with Options** — the control panel will ask whether to print the job in Production Quality mode, or to cancel the job.
- **Use Production Quality** — the job will be automatically printed in Production Quality mode.
- **Cancel** — the job will be automatically canceled.

To print at 600x300 dpi, set the RIP or ColorSpan print server to rasterize (RIP) print jobs at this resolution before sending them to the printer. If the printer is set to print in Billboard Quality or High Quality, the job will be handled as selected at the control panel.

8. Press the ▲ and ▼ and keys to highlight a 600x300 dpi Job Handling option.
9. Press the ✓ (Set) key to select the option.

   The UV lamps settings appear.

10. Select a UV lamps setting.

    When you select a bidirectional print mode, select one of the following settings:

Setting	Leading Lamp	Trailing Lamp
High	High	High
Medium	High	Low
Low	Low	Low
Off	Off	Off

When you select a unidirectional mode, select one of the following settings:

Setting	Leading Lamp	Trailing Lamp
High	High	High
Medium	High	Low
Low	Low	Low
Leading High	High	Off
Leading Low	Low	Off
Trailing High	Off	High
Trailing Low	Off	Low
Off	Off	Off

- For standard media listed in the Media Wizard, leave the lamp settings at their default values, at least at first.
- Faster print modes require higher lamp settings to ensure sufficient curing.
- If the ink is not curing, increase the setting. The lamps will gradually lose curing effectiveness, so increasing the setting may eventually become necessary. (For infomation about UV lamp life, see "Replacing UV Lamp Bulbs" on page 5-20.)
- If the media is wrinkling or warping from the heat of the lamps, lower the setting.
- Use caution when turning off one of the lamps in the unidirectional modes. If the difference in total operating time between the lamps becomes significant, visible print anomolies may result. To prevent this or rebalance the hours, alternate printing directions between Unidirectional Left and Unidirectional Right.
- Do not select the **Off** setting unless necessary for troubleshooting or maintenance. The ink will not cure if at least one of the lamps is not on during printing.

Checking Jet Health

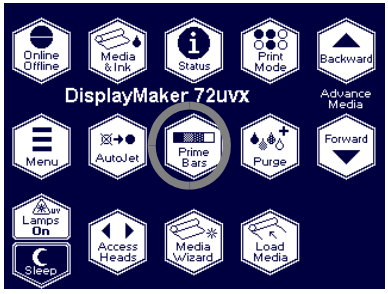
When AutoJet detects a missing jet, it attempts to replace it with a working jet on the same or another printhead (in Production and High Quality modes). In this way, printing occurs with all jets for maximum quality.

When you notice a decrease in print quality, one or more inkjets may be clogged. To recover clogged jets:

1. Print a **Prime Bars** pattern to determine whether there are any missing jets (see below).
2. Run **AutoJet** (page 4-3) or **Manual Jet Mapping** (page 4-18).
3. If there are any missing jets, **Print Jet-Out Lines (see** below**).**

Repeat this process until all jets are working or substituted for another jet.

Print Prime Bars



1. From the control panel Front Page screen, press the **Prime Bars** key.

   The control panel displays a prompt asking you to enter the total width of the prime bar pattern you wish to print.

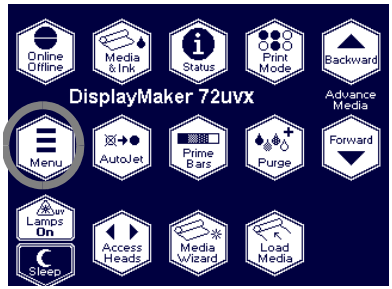
2. Enter a width for the prime bar pattern by pressing the ▼ and ▲ keys.
3. Press the ▶ (Proceed) key to continue.

   The printer prints the prime bar pattern. The prime bars will show correctly working jets with a solid line, and missing jets with no line.

Map Out Missing Jets

If the Prime Bars (above) reveal a blank lines, the corresponding jets should be mapped out. For instructions, see “AutoJet” on page 4-3 or “Manual Jet Mapping” on page 4-18. When all missing jets have been substituted, printed output will appear as if all jets are working.

Print Jet-Out Lines



1. From the control panel Front Page screen, press the ☰ (Menu) key.
2. Press the ▼ key to highlight **Maintenance**.
3. Press the ↷ (Menu In) key.
4. Press ▼ to highlight **Print Jet-Out Lines.**
5. Press the ↷ (Menu In) key.

   The Jet-Out Lines pattern prints. Substituted jets are marked with a black square.

Loading Ink

When to Load Ink

The amount of ink in the ink box is tracked by the printer software and recorded on its corresponding profiler. When the ink box is almost empty, the LED above the corresponding profiler will blink. You should replace the ink box with a full ink box of the same color ink as soon as possible. The status of each ink box and profiler is indicated by the LEDs as follows:

- **Off** — OK
- **Slow Blink** — profiler is being verified after insertion
- **Fast Blink** — low ink warning (300 ml remaining, amount can be changed by the user)
- **On** — ink system action (ink empty, ink pump failure, profiler error, or other), see control panel

Unloading an Empty Ink Box

1. Remove the profiler.
2. Lift the box out of its holder and turn the box upside down so the ink tube is pointing up.
3. Push the button at the end of the ink tube connector and disengage the tube from the ink box.
4. Remove and dispose of the ink box (refer to the MSDS for proper disposal procedures).

Loading a Full Ink Box

1. Open the new ink box and locate the supply connector.

Fig. 3-1. Ink box with supply connector

2. Connect the ink supply tube to the ink box.

   Grasp and squeeze the ink tube connector as shown, engage the connector to the ink box, and release the connector. Ensure that the connectors are firmly engaged before proceeding.

Fig. 3-2. Connecting the ink tube to the ink box

3. Invert and install the ink box into position in the holder.

   The position for each ink color is shown on a label below the ink box holder (on the pump cover) and on the profiler docking station.

4. Install the profiler in the corresponding docking station slot.

Pause-Swapping Ink

You can replace one or more ink boxes during a print by pausing the printer:

1. On the printer control panel, press the ⏸ (Pause) key.
2. Remove the old profiler.

   This signals to the printer that the ink box is being replaced.

3. Disconnect and remove the old ink box.
4. Install and connect the new ink box.
5. Install the profiler that was included with the new ink box.

   The LED above the profiler blinks slowly while the printer reads and verifies the profiler. The LED goes out after the profiler has been verified as a valid profiler with ink remaining.

6. Repeat steps 2 through 5 for any other ink boxes you want to replace.
7. On the printer control panel, press the ▶ (Resume) key.

Loading Roll-Fed Media

The printer includes a tensioned supply and takeup system designed to handle vinyl and other heavier media on three-inch cores. The media handling system automatically detects the size of the supply and takeup rolls and provides consistent tension as the rolls change size during printing.

With the corresponding collets, media on 2-inch cores can be loaded onto the supply, but only 3-inch collets can be used on the takeup.

Tip Wear cotton gloves when loading media, or handle the media only by its very outside edges. This will prevent skin oils from being deposited on the media, which could be visible on printed output.

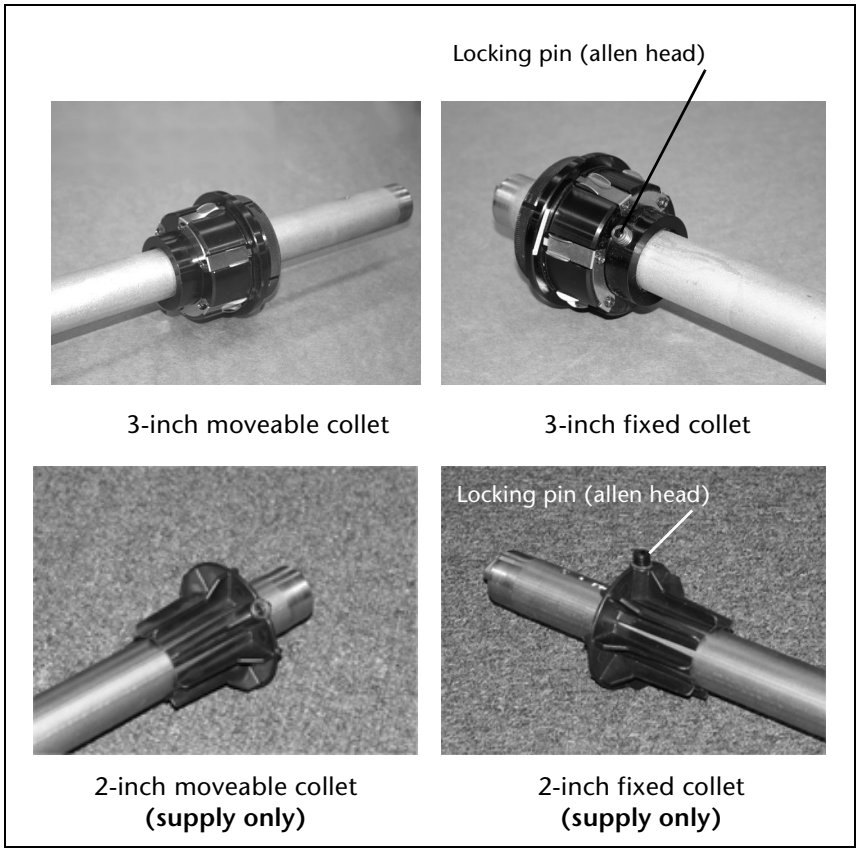


Fig. 3-3. 3-inch and 2-inch collets

Support for Large Narrow Media Rolls

For printing with large rolls of narrow media, (less than 72 inches wide), the 98-inch model of the printer includes spool support accessories to prevent the spools from bowing under the weight:

- Spool support — attaches to the stand crossbar, supports the supply and takekup spools.

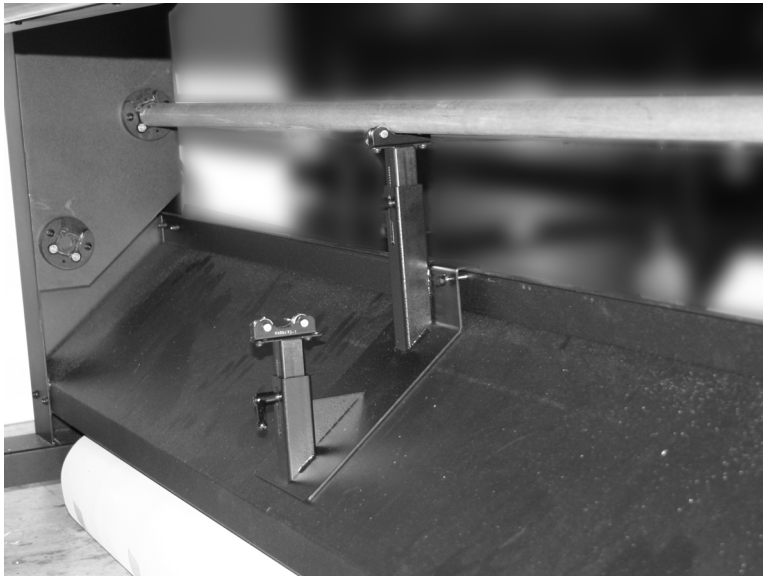


Fig. 3-4. Spool support

- Spool sleeve — slides over the spool with locking collets.

Fig. 3-5. Spool sleeve

1. Ensure that the fixed collet is properly located with the screw tightened into the inner hole on the supply spool (using the outer hole would prevent the spool from being installed).

   The side of the spool with the fixed collet is the "home" side, closest to the printer's electronics box.

2. Remove the moveable collet from the spool.

Note The 3-inch collets have *left-handed* threads that self-tighten during printing. Turn the locking ring clockwise to *loosen*, and counterclockwise to *tighten*.

3. Optionally, if using large rolls of narrower media, install the spool support and/or sleeve (see Fig. 3-4 and Fig. 3-5).
4. Load the media roll onto the spool.
5. Load and secure the moveable collet against the end of the media roll.

   The moveable collet does not have a metal pin. Push the collet into the media core, and (on 3-inch collets) turn the locking ring counterclockwise to secure it in place.

6. From the rear of the printer, load the media and spool into the printer's supply spool holder.

   Press the home side of the supply spool into the home side holder (on the left from the rear of the printer), then swing the far side of the supply spool into the far side holder (on the right).

   You can load the supply spool so that the media either unspools from the bottom or the top of the roll (see Fig. 3-6

below). This enables you to print on either side of the media.

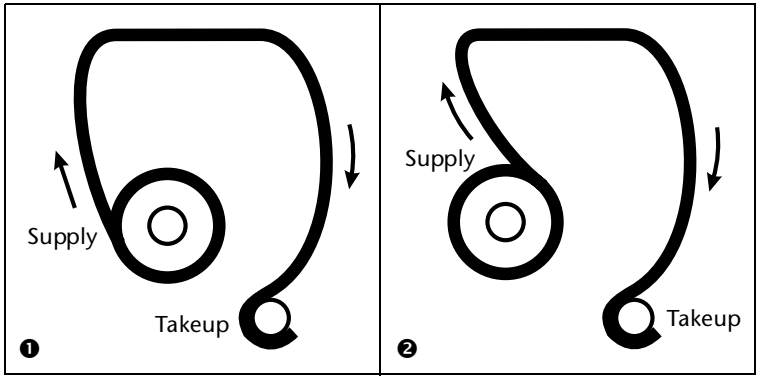
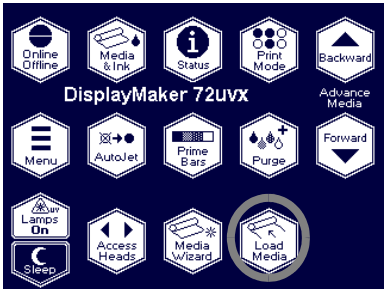


Fig. 3-6. Media path options

7. Ensure that the media is rolled onto the supply spool evenly, without "telescoping" to one side.
8. Release the pinch rollers so that media can be fed through them freely.
9. Feed the media through the pinch rollers and onto the platen.
10. From the front of the printer, pull the media web taut so that the media feeds in a straight line from the supply, with no wrinkles.

    This is easier with two persons. If loading with one person, first lower the pinch rollers, walk around to the front of the printer, release the pinch rollers, then straighten the media.

11. Lower the pinch rollers onto the media.



12. On the Front Page screen of the control panel, press the Load Media key.

    The control panel presents a list of media types. You can select from the list or select Custom (at the end of the list) to specify a new media. The printer's Media Wizard feature stores a set of parameters for each media type, which can be recalled and applied whenever you change media types. (See "Edge-to-Edge Printing" on page 3-36 for details.)

13. Select the media type you are loading, or create a new media type.

    The control panel displays the current settings for the media type you chose.

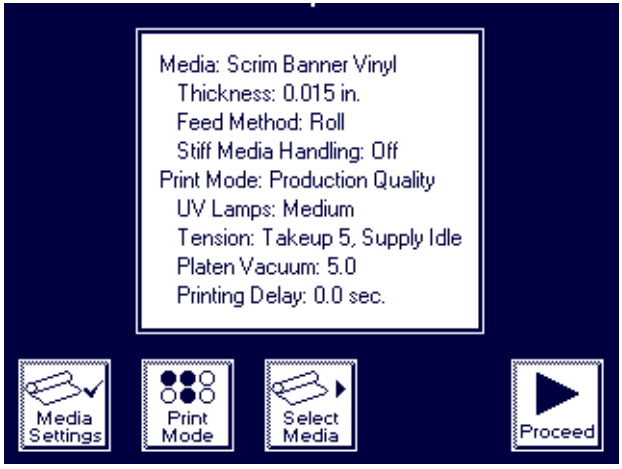


Fig. 3-7. Media settings (roll-fed)

14. Press one of the change keys to change any of the settings, print mode, or media type, or press the ▶ key to continue.

    - If you press one of the change keys, a screen appears to allow you to change any of the settings. Then press the ▶ key to continue. See "Media Wizard" on page 3-42 for information about these settings.

- If you press ▶, the control panel displays a numeric keypad:

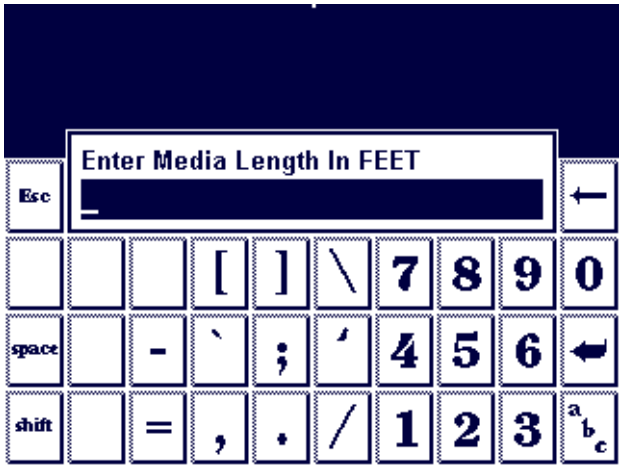


Fig. 3-8. Numeric entry screen

15. Enter the length of the media roll (if it is a new roll) or the length remaining (if it is a partially used roll), and press the **Enter** key to continue.

    To skip this step, press **Esc** without entering a value.

    The control panel displays the prompt:

    Attach media to takeup.
    Press Proceed when media is ready to be loaded.

16. Press the **Adv. to Takeup** key to advance the media to the takeup spool. You can press **Stop** if necessary to stop the media advance at any time.
17. Grasp the middle of the media web, pull straight back, route the media underneath the takeup core, and tape it to the takeup core as shown in Fig. 3-6 on page 3-18.

    If necessary, you can use the arrow keys on the control panel screen to move the media forward or backward.

Note With the fixed collets securely pinned to the supply and takeup spools (see Fig. 3-3), position the media on the takeup core in the same relative position as it is wound on the supply core. For example, if the media is positioned 0.125 inches (3 mm) from the left end of the supply core, it should be positioned the same distance from the left end of the takeup core. If necessary, the 3-inch collets on the takeup spool can be loosened so that the core can be moved to the right or left.

18. Press the ▶ key to continue.

    The printer tensions the supply and takeup system, turns on the platen vacuum fans, and measures the width of the media by locating the right and left edges with the digital image sensor (camera) on the printhead carriage.

    The printer displays the following message:

    Media loaded successfully.

    Current Media Feed Number:

19. Accept the Media Feed Number, enter a new Media Feed Number, or press the **Calibrate Media Feed** key to perform a media feed calibration.

    Record the media feed number and the media type you loaded for future reference. See “Media Feed” on page 4-9 for further information.

    You are now ready to begin printing.

Unloading and Cutting Roll-Fed Media

1. Press the ▼ key on the Front Page screen to advance the printed portion of the media past the platen.
2. On the Front Page screen of the control panel, press the **Unload** key.
3. The control panel prompts you to press ▶ to unload media, or ✕ to cancel.
4. Press ▶ to continue.

   This detensions the supply and takeup spools.

5. Cut through the media with a utility knife below the platen.

   As you cut the media from the printer, hold it to prevent it from falling to the floor and possibly damaging it.

Note If you scratch the platen while cutting media, be sure to buff them out with a fine grade of sandpaper. Scratches in the platen can cause media feed inconsistencies, which can lead to head strikes and artifacts in printed output.

6. Take the single print or the entire takeup spool with printed output to your finishing area, and re-load the takeup system.
   - To re-load the takeup, from the menu, press the **Load** key on the control panel.

Takeup Spool Pin Release

To quickly unspool a large amount of media from the takeup without damaging the takeup tension spring, you must first disengage the spool from the takeup system.

The spool is normally engaged to the takeup motor with a tab at the end of the spool. To disengage this tab, press the **Unload** key to detension the supply & takeup system, then insert the takeup spool pin release tool (supplied, part number 0504334) between the spool and the bracket that holds the spool. This allows the spool to spin independently from the takeup as you pull media from it. When you are ready to begin printing, remove the pin release tool and press the **Load** key on the control panel.

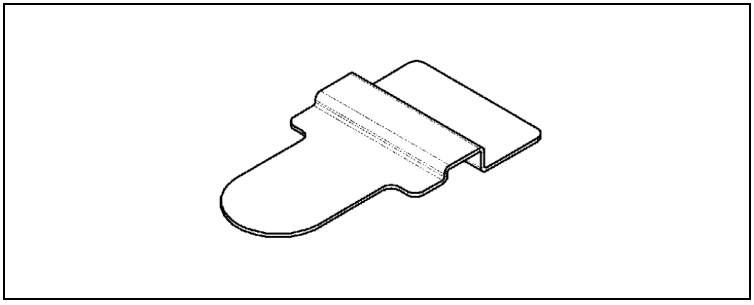


Fig. 3-9. Takeup spool pin release tool

Respooling Media

The printer can respool media from one cardboard core to another. You may want to do this if:

- The media was not taped to its core by the media vendor, which makes tensioning impossible.
- You want to change the direction that the media unwinds from the core (printed side out vs. printed side in).

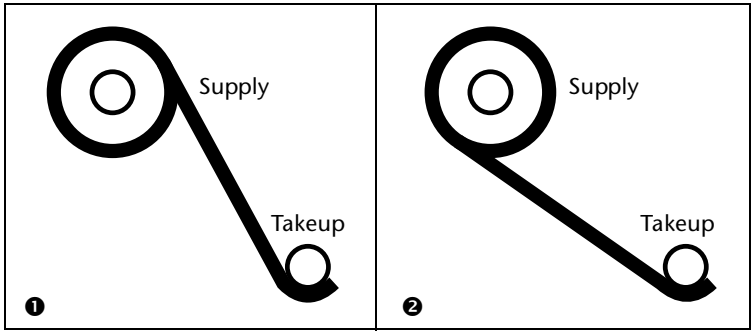


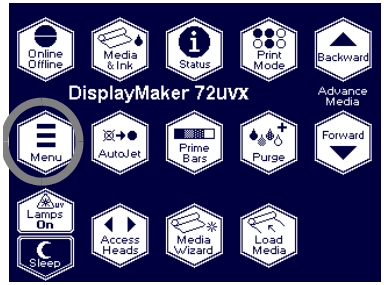
Fig. 3-10. Respooling load options

1. Load media on the supply.
2. Load an empty cardboard core on the takeup.
3. Slowly pull media from the supply spool to the takeup.

   Do not pull the media faster than the supply motor releases it. Route the media directly to the takeup. Do not route it over the platen and heaters.

   Ensure that the right and left edges of the media web are perpendicular to the sides of the printer, that the tension appears uniform across the media web, and that the media is not unrolling unevenly (“telescoping”) from the supply spool.

4. Tape the end of the media to the takeup core.
5. Press the ☰ (Menu) key from the Front Page screen on the control panel to display the menus.
6. From the control panel menu, press the ▼ key to highlight **Maintenance.**
7. Press the ↷ (Menu In) key.
8. From the Maintenance menu, press the ▼ key to highlight **Respool Media.**
9. Press the ↷ (Menu In) key.



10. Press the ▶ (Proceed) key to respool the media.

    The media is pulled from the supply spool onto the takeup spool. When the printer detects the end of the media, the respool function stops automatically.

Printing Tips

- **Printing without the takeup** — cured output is dry to the touch immediately, so roll-fed output can be allowed to collect on the floor (for example, during unattended printing) without using the takeup system, with no damage to the output. Printing without the takeup also eliminates the possibility of banding in output due to takeup tension effects.
- **Curing continues for 24-48 hours** — the UV ink will continue to cure for a day or two after printing. Maximum durability and adhesion is achieved after the ink is fully cured.
- **Pausing printing** — to pause printing, press the ⏸ (Pause) key. While printing is paused, you can:
  - Perform a Standard Purge of one or more colors, to restore missing inkjets.
  - Change media settings (vacuum, print delay).
  - Pause-swap inks (see "Pause-Swapping Ink" on page 3-14).

Using the Media Tables

The media tables are designed specifically to handle rigid media for this printer. When the printer was installed by an authorized service provider, the installer should have assembled and leveled both tables to the printer (after leveling the printer). If a second set of tables was purchased, the installer should have assembled and leveled them as well. The printer platen and tables should lie in the same horizontal plane to ensure smooth and accurate media advance.

Before using the tables, check the following:

- The input table, at the rear of the printer, has a reflector that is located under the media sensor and pinch roller adjustment lever when the table is in operating position. If not, the wrong (output) table may be installed.
- After leveling, the jam nuts on each of the tables' leveling feet are tightened to prevent them from moving up or down.
- The stabilizer bars (and clamps for the second table if used) are securely fastened to the tables and bracket below the printer platen. This is especially important when printing on heavy media.

You can quickly convert the printer from sheet-fed to roll-fed operation by unclamping the stabilizer bars from the bracket at the bottom of the platen. If the jam nuts on the leveling feet are tight, the table can be moved where necessary and reattached to the printer without releveling. Similarly, the clamps for the second set of tables also can be disconnected and reconnected easily.

Fig. 3-11. Media tables

Loading Rigid Media

The printer has two media load states:

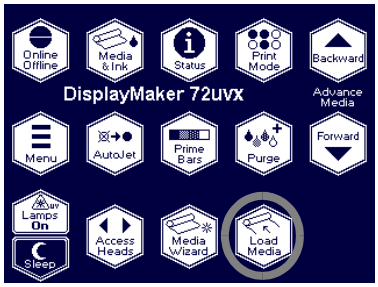
- **Unloaded** — the printer is ready to accept either roll-fed or rigid cut-sheet media
- **Loaded** — the Media Wizard has stored parameters for the currently-loaded cut-sheet media, allowing you to reload multiple cut sheets without reentering the Media Wizard

Caution Rigid synthetic media commonly used for inkjet printing can build up a static charge, especially in environments with low relative humidity. This charge can pose an electrostatic discharge (ESD) hazard to persons, the printer, and other equipment. It can be safely discharged by draping a grounded chain or tinsel over the top of the stack, or with the optional ionizer bar (contact your reseller or MacDermid ColorSpan to order).

Tip If you are printing multiple copies of the same image on rigid cut-sheet media, you can skip much of the load process by using the Reload Media function for the second and subsequent prints. See "Unloading and Reloading Rigid Media" on page 3-35 for details.

For optimal results when printing on rigid cut-sheet media:

- Ensure that the printer has been correctly assembled and leveled, and operates on a flat, stable floor.
- Ensure that the media input and output tables have been correctly assembled, are level left-to-right, and are at the same height as the printer platen.
- Use only flat, unwarped or damaged sheets, with parallel opposite edges and 90° corners.



1. On the Front Page screen of the control panel, press the **Load Media** key.

   The control panel presents a list of media types. You can select a ColorSpan media from the list, or select Custom (at the end of the list) to specify a new media. The printer's Media Wizard feature stores a set of parameters for each media type, which can be recalled and applied whenever you change media types. (See "Media Wizard" on page 3-42 for details.)

2. Select the media type you are loading, or create a new media type.

   The control panel displays the current settings for the media type you choose.

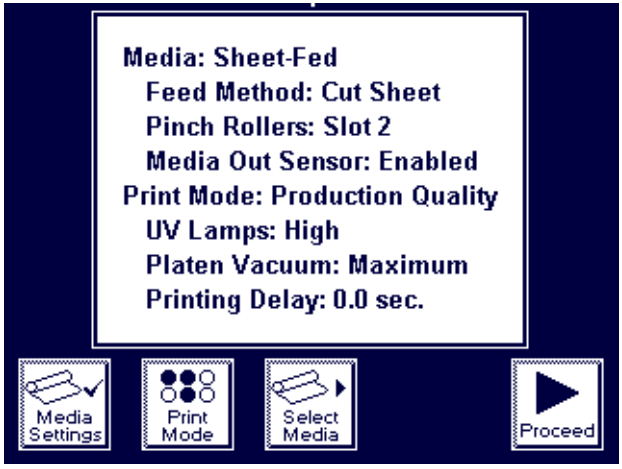


Fig. 3-12. Media settings

   If you are creating a new media type, you are prompted to enter a Media Name and Thickness.

3. Press one of the change keys to change any of the settings, print mode, or media type, or press the ▶ key to continue.

   - If you press one of the change keys, a screen appears to allow you to change any of the settings. Then press the ▶ key to continue. See "Media Wizard" on page 3-42 for information about these settings.

4. Enter the length of the media, then press the ▶ key to continue.

   The control panel displays the prompt:

   Load a sheet of media onto the printer.

5. Release the pinch rollers.
6. Slide a sheet of media onto the platen and into the pinch rollers.
7. Install the media alignment bar onto the platen.

   The pins on the media alignment bar engage corresponding vacuum holes in the platen.

Fig. 3-13. Media alignment bar, installed

8. Slide the media forward until it is flush with the media alignment bar.

   The media alignment bar is 0.25 inches (6.35 mm) high.

9. If necessary, prepare the printer to print on thicker or thinner media.

   To shield the UV light, the printer requires different setups when printing on media thicker than 0.25 inches (6.35 mm) than when printing on media less than this thickness. If the height of sheet-fed media exceeds 0.25 inches (6.35 mm) — the height of the media alignment bar, you must prepare the printer as follows before printing:

   - Raise the head height (see "Set the Printhead Height" on page 5-11)
   - Raise the right-side louver assembly
   - Install the left-side light-blocking mat (engage the two pins on the mat into two corresponding vacuum holes in the platen near the edge of the media)

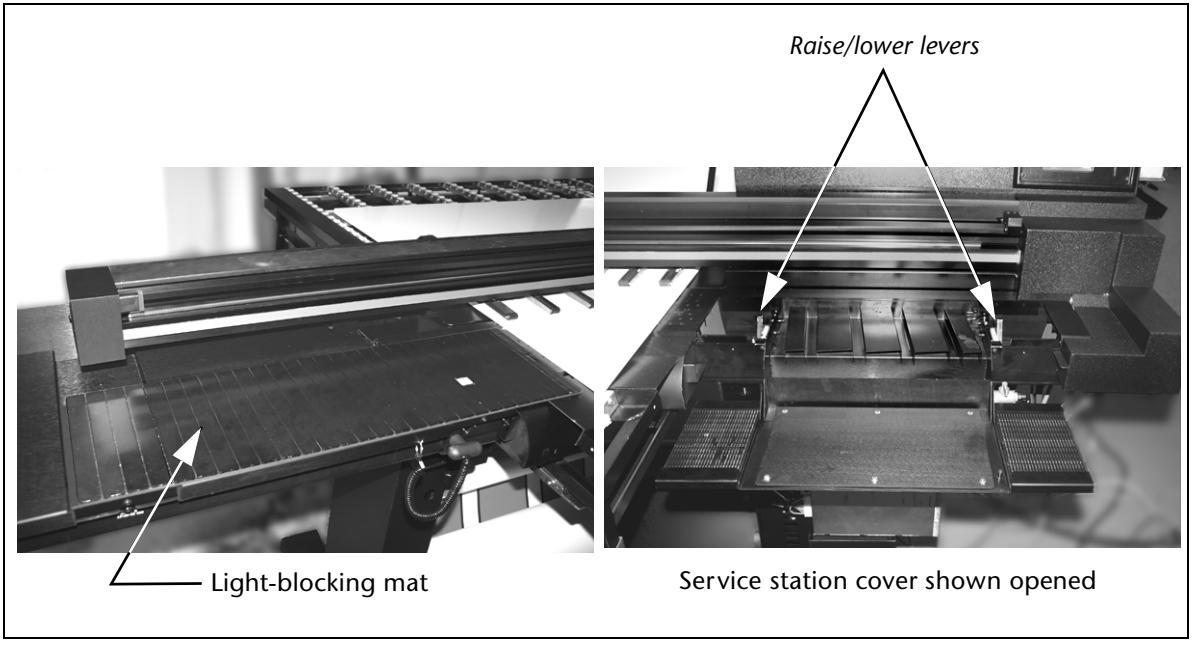


Fig. 3-14. Preparing the printer to print on 0.25-0.50 inch media

10. Set the pinch roller tension as specified in the Media Wizard.

    If a right or left edge of the media is partially under a pinch roller, the media may become damaged. You can insert a pinch roller release block (part number 0506093) between the pinch roller and the rail to temporarily disable (raise) a pinch roller. One of the block's two indents should rest on the pinch roller's pivot.

    - To engage the back of the rail and raise the pinch roller, push the block back so the second indent rests in the pivot.
    - To disengage the back of the rail and lower the pinch roller, pull the block forward so that its first indent rests in the pivot.

Media edge partially under roller

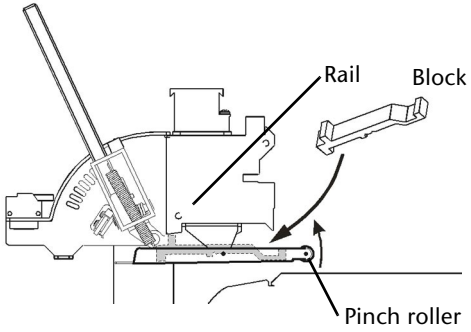


Fig. 3-15. Using the pinch roller release block

11. Remove the media alignment bar.
12. Press the **Platen Vacuum Setting** key if you want to change the platen vacuum setting.
13. Press the ▶ key to continue.

    The control panel asks whether you want to adjust the head height.

    - If you press **Yes,** the control panel enters the head height, service station height, and bidi calibration procedures. (See Chapters 4 and 5 for instructions.)
    - If you press **No,** the media load procedure continues.

    The printhead carriage moves out of the service station and uses the onboard digital imaging sensor ("camera") to locate the right, front, and left edges of the media, and to deter-

mine whether the sheet was loaded squarely into the printer. Then it moves the media into position to begin printing. For instructions on changing the way the printer measures the media, see Measure Media Type on page 2-13.

14. If the media is skewed, the control panel asks whether you want to adjust it.

    - If you press **Yes,** you can release the pinch rollers, adjust the media, lower the pinch rollers, and press the Proceed key to continue.
    - If you press **No,** the media load procedure continues.

    The control panel briefly displays the measured width of the media, then displays a numeric keypad so you can enter the length of the media.

Tip If you intend to print edge-to-edge, precise alignment of the media is necessary. See "Edge-to-Edge Printing" on page 3-36 for instructions.

15. Press the ▶ key to continue.

    The control panel displays a screen that shows the following information:

    - Media size
    - Print area
    - Right & left margins
    - Leading margin
    - Trailing margin
    - Print position

16. To change the margin settings, press the **Margin Settings** key; otherwise, press the ▶ key to continue.

    The printer moves the media to the proper position for printing and displays this message:

    Media loaded successfully.

    Current Media Feed Number:

17. Accept the Media Feed Number, enter a new Media Feed Number, or press the **Calibrate Media Feed** key to perform a media feed calibration.

Record the media feed number and the media type you loaded for future reference. See “Media Feed” on page 4-9 for further information.

18. Press the **Online** key to receive a print job from the print server or RIP.

    After a print job has finished printing, the media is automatically advanced (ejected) from the pinch rollers.

Note Before a print job is received, you can unload the media at any time by pressing the **Unload** key on the Front Page screen of the control panel.

Unloading and Reloading Rigid Media

After printing onto a sheet of rigid media, the Front Page screen displays a special **Load/Reload** key.

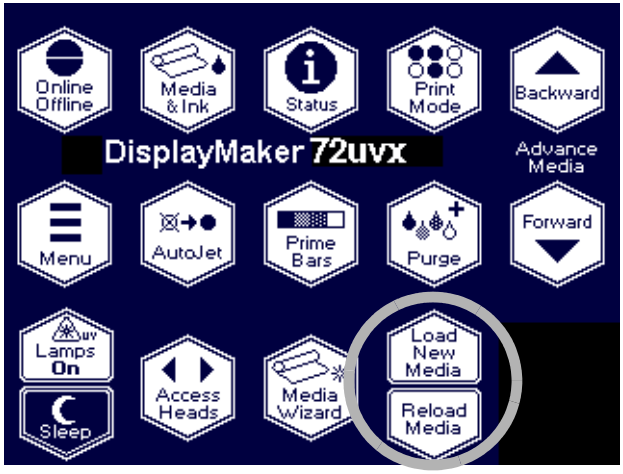


Fig. 3-16. Load/Reload key

- **Load New Media** — press this key to re-enter the Media Wizard and select a new media to load (either roll-fed or rigid cut-sheet)
- **Reload Media** — press this key to re-load the same media type, for example to print multiple copies of the same image

You can also press the **Unload** key to return the printer to an unloaded state. In this case, the Front Panel screen displays the standard **Load** and **Unload** keys.

Edge-to-Edge Printing

The printer can print up to or past the edges of rigid media. This provides the look of a "full-bleed" print without trimming the media. For best results, follow these guidelines.

Tip MacDermid ColorSpan has developed an extensive set of tips and techniques for printing on rigid media, including edge-to-edge and double-sided printing. See the MacDermid ColorSpan web site, or Contact Technical Services at (800) 925-0563 or (952) 944-4040, and ask for Tech Note #2730, "Straight-Through Paper Path: A Handbook for Users."

Document, Application, and RIP Settings

- To ensure that the printer will print past the edges of the media, design or enlarge the job slightly larger than the media. For example, if the media is 32 inches wide, set an Overprint distance of 0.125 inches (see **Menu > Printer Settings > Margin Settings**) and size the document to 32.25 inches wide.
- For images with a special detail at the edge of the page, such as a border, make the border line thicker than usual to extend past the edges of the page.

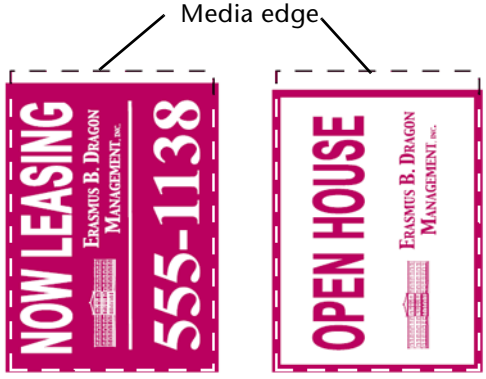


Fig. 3-17. Laying out a full-bleed document (shown with bleeds off three sides)

Media Properties

- Follow the guidelines in this chapter for printing on rigid media.
- The media should have parallel opposite edges with 90-degree corners. Media that is not exactly square with itself can be used, but will require extra attention when loading (see "Loading and Squaring the Media," below).
- To print to the trailing edge, attach a 6.5 inch (16.5 cm) or longer trailer of the same media to the trailing edge, so the pinch rollers can feed the media all the way past the print zone.

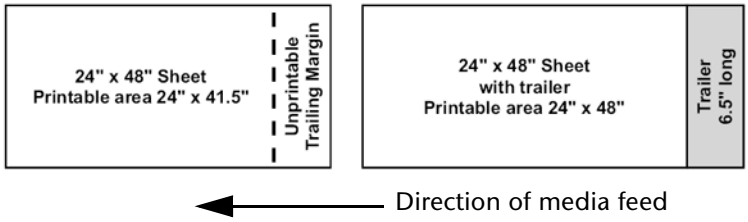


Fig. 3-18. Attaching a trailer

Printer Setup

- Tape the platen under the left and right edges of the media to catch any oversprayed ink. Use a colored tape to allow the printer to find the media edges. A piece of media printed with a solid color also works for this purpose. Do not use white tape or media; the printer uses the contrast between the media and the platen to find the media edges.
- Use the supplied head height gauge to set the printhead height over the media.
- From **Menu > Printer Settings > Margin Settings,** set the Right and Left Margin, and Leading Margin to 0 as desired. Set the Trailing Margin to 6.5 inches (which is the minimum).
- Optionally, you can set an Overprint distance between 0 and 0.5 inches to print past the left and right edges (0.125 inches to 0.25 inches is usually sufficient if the media is reasonably square and unskewed).
- From **Menu > Printer Settings > Print Position,** center the image on the media.
- When loading the media, report the length as the total length of the media plus trailer.

- Under **Menu > Printer Settings > Media Measure Type**, choose **Maximal** for greatest precision and skew detection when printing edge-to-edge. It measures the width of the media in two places, and finds the front edge in two places to estimate skew and detect non-rectangular sheets. The printer will report if the media appears to be skewed and therefore will not feed straight through the print zone. If the media is not actually skewed, one or more of its edges may not be parallel to each other.

Loading and Squaring the Media

- Load the media as described in "Loading Rigid Media," earlier in this chapter.
- If the printer discovers that the media is skewed, you can reposition most media without releasing the pinch rollers by nudging the trailing edge right or left to correct the skew.

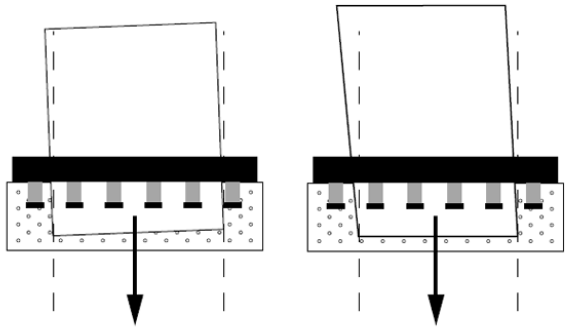


Fig. 3-19. Skewed (left) and non-square (right) sheets

- If the printer reports that the media is skewed, but you cannot correct the skew, the sheet may not be perfectly square (90-degree corners with parallel sides). In this case, ensure that the right edge of the media (closest to the control panel) is parallel to the direction of media feed. (You can use the fence on the input (rear) table as a guide after squaring it to the platen.) Then use the procedures described previously to ensure enough overprinting to account for the shape of the sheet. If insufficient overprinting occurs, the sheet may need to be trimmed for a bleed effect.

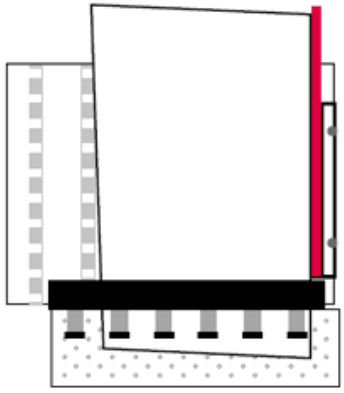


Fig. 3-20. Feeding a non-square sheet

Example Document Design

- Media size: 48x96 inches (4x8 feet)
- Bleeds: Full bleed
- Document size in application software: 48.5 inches x 96.0 inches, to include an overprint of 0.25 inches on the left and right edges (the printer will not overprint the leading edge, to avoid feeding the media over wet ink on the platen)

Media Properties

- The operator selects a flat sheet of 4x8-foot media with opposite sides parallel and all four corners at 90 degree angles.
- The operator attaches a trailer that is 6.5 inches (16.5 cm) long and 48 inches wide to the trailing edge of the media, applying the adhesive tape to the back side.

Printer Setup

- The operator applies colored masking tape to the platen where the right and left edges of the media will feed, to prevent overprinting onto the platen.
- The operator sets the head height over the media.
- The operator configures the following options on the printer control panel:
  - **Menu > Printer Settings > Margin Settings > Left & Right Margin:** 0 inches, Overprint Distance: 0.25 inches
  - **Menu > Printer Settings > Margin Settings > Leading Margin:** 0 inches
  - **Menu > Printer Settings > Margin Settings > Trailing Margin:** 6.5 inches
  - **Menu > Printer Settings > Print Position:** Center
  - **Menu > Printer Settings > Media Measure Type:** Maximal
  - Media length (entered during **Load Media**): 102.5 inches = 96.0 inch media length + 6.5 inch trailer

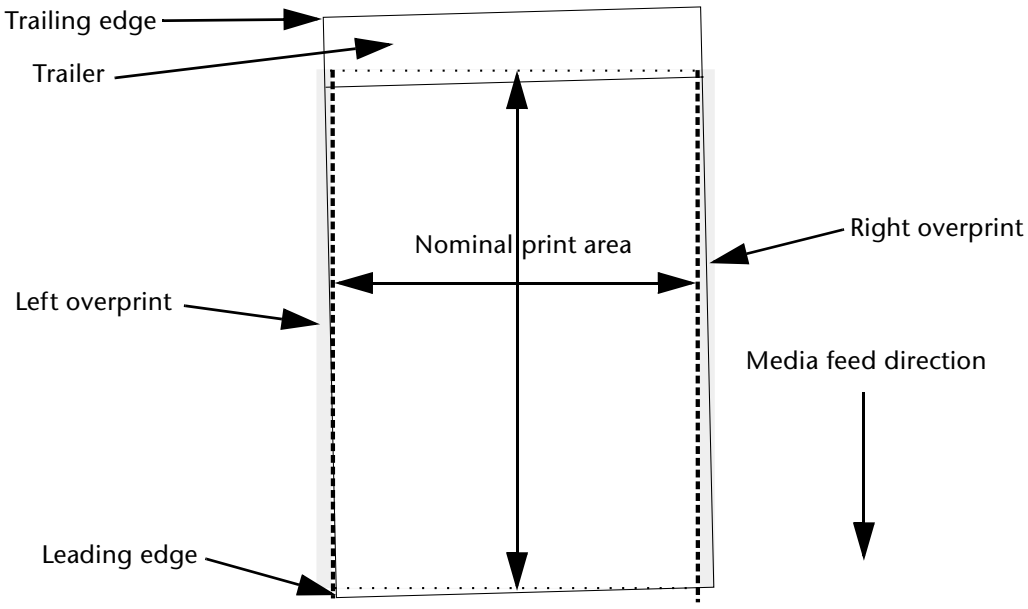


Fig. 3-21. Edge-to-edge printing terminology

- During **Load Media,** the printer locates two points on each of the leading, left, and right edges of the media. The printer uses these data points, and assumes 90-degree corners and parallel sides, to determine the skew of the media. If the media is skewed enough that an unprinted left or right edge may result, even with a margin of 0 and the amount of overprinting specified, the control panel displays a message with the skew amount:

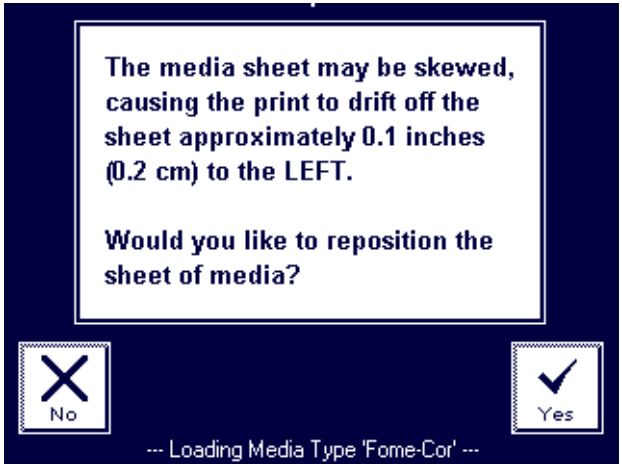

The media sheet may be skewed, causing the print to drift off the sheet approximately 0.1 inches (0.2 cm) to the LEFT.
Would you like to reposition the sheet of media?
No
Yes
--- Loading Media Type 'Fome-Cor' ---

Fig. 3-22. Skew message

Correct the skew by nudging the trailing edge of the media by the distance left or right as reported by the control panel, without releasing the pinch rollers. Allow the printer to measure the media again. Repeat until the skew is within tolerance.

Note LEFT and RIGHT are defined as if facing the front of the printer: RIGHT is toward the control panel, LEFT is toward the opposite end.

Tip If you set the overprint distance to a smaller number, there will be less skew tolerance before the printer reports too much skew. If you set a larger overprint distance, the printer will permit a greater amount of media skew before displaying the error message.

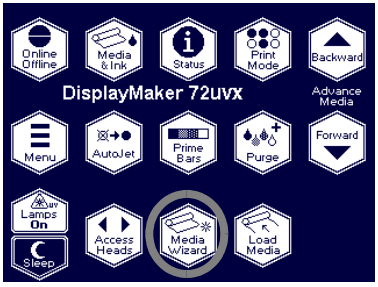
Media Wizard

The Media Wizard software feature stores a set of printing parameters by media type, enabling you to instantly optimize the printer whenever you change media. The Media Wizard includes standard sets of parameters for popular media types, and allows you to define new settings for media types you define.

The Media Wizard can store a different set of settings for each of the print modes (Billboard Quality, Production Quality, High Quality), or use the same settings for all modes.

The Media Wizard is accessible during the media load process and from the Front Page screen (as follows).

Tip To use the Media Wizard most efficiently, start by using one of the standard media types. If you are not using a standard media type, select the standard media type that most closely matches the media you are using. Then only if necessary, create a new media type using the standard type you selected as a starting point, and adjust it as needed.



1. From the Front Page screen, press the **Media Wizard** key.

   The Media Wizard menu appears. It contains the following options:

   - **Media Settings** — displays the settings currently stored in the Media Wizard
   - **Create Media Type** — creates a new media type using settings you specify
   - **Delete Media Type** — deletes a user-created media type
   - **View Media Types** — allows you to view each of the media types stored in the Media Wizard
   - **Set Sort Method** — allows you to sort the list of media names Alphabetically, by Most Used, Recently Used, Sheet-fed First, Roll-fed First, or None (preserves the current order).

2. When you select **Media Settings,** the control panel displays the current settings.

   - To change the current settings, press the **Media Settings** key.

- To return to the Media Wizard menu, press the ▶ (Proceed) key.

For each media type, the Media Wizard stores the following settings (as indicated, some settings apply to either roll-fed or cut sheet media only):

- **Media Name** — for user-defined media, use the alphabetic keyboard displayed on the control panel to enter the media name. (Standard media names cannot be changed.)
- **Media Thickness** — for user-defined media, use the numeric keyboard displayed on the control panel to enter the media thickness (caliper). (Standard media thickness cannot be changed.) Thickness is used for reference only, so this can be left blank for custom media.
- **Feed Method** — Roll or Cut Sheet.
- **Stiff Media Handling (roll fed)** — when enabled, detensions then retensions the takeup system before every print job, for more accurate feeding of adhesive-backed and other stiffer roll-fed media types.
- **Measure Width** — choose whether the media width should be measured automatically by the printer, or manually by the user.
- **Print Mode** — you can store different Media Wizard settings for each print mode (see "Selecting a Print Mode" on page 3-6).
- **UV Lamps** — see "Selecting a Print Mode" on page 3-6 for the possible UV lamp settings.
- **Takeup Tension (roll fed)** — select a tension setting from 1 (low) to 10 (high), or select 0 for idle (no tension).

  Takeup tension is used to ensure that the media web feeds straight from supply and takeup, and lies flat on the platen. Use the lowest tension settings that allow correct media feed.

  When the takeup tension is set to idle, printed output is not automatically wound onto the takeup spool. In this mode, however, a key appears on the control panel that enables you to wind the takeup spool manually. If the end of the media is taped to the takeup core, you can use this key to control how tightly the media is wound onto the core.

- **Supply Tension (roll fed on 72UVX only)** — select a tension setting from 1 (low) to 5 (high), or select 0 for idle tension.
- **Pinch Roller Slot (cut sheet)** — adjustable pinch roller setting, from 1 (highest force) to 12 (lowest force). Select the lowest pressure that results in good media advance without leaving pinch roller marks on the media.
- **Media Out Sensor (cut sheet)** — detects when rigid cut sheet media is out. Normally enabled; disable only if the sensor is malfunctioning.
- **Platen Vacuum** — this option turns on the vacuum fans, and displays ▲ and ▼ keys on the control panel. Press ▲ and ▼ to raise or lower the fan speed, and observe the media as the fan speed changes. If the media is lifting off the platen, increase the fan speed. If the media is sticking to the platen, decrease the fan speed.
- **Printing Delay** — press the ▲ and ▼ keys on the control panel to increase or decrease the delay (seconds per print swath). To increase throughput, decrease the delay.

3. When you select **Create Media Type,** the Media Wizard displays a series of screens that enable you to enter each of the Media Wizard settings.

   The current settings as shown on the Media Settings screen are used as default values. Change the defaults to suit the new media for each print mode.

4. When you select **Delete Media Type,** the Media Wizard shows a list of currently defined media. You can delete any user-defined media type.
5. When you select **View Media Types,** the Media Wizard allows you to browse through the settings for each of the media types and print modes.
6. When you select **Set Sort Method**, the Media Wizard enables you to sort the list of media names.

CHAPTER 4

Calibrating the Printer

This chapter explains how to calibrate the printer for the best possible output:

- When to Calibrate (page 4-2)
- AutoJet (page 4-3)
- AutoTune (page 4-4)
- Auto Calibrations (page 4-6) — AutoBiDi Calibration, AutoH2H (Head-to-Head) Calibration, AutoJet Calibration, Full AutoSet
- Manual Calibrations (page 4-8) — Media Feed, Manual BiDi Registration, Manual X Head Registration, Manual Jet Mapping, Jet Status Lines, Default Registration Data
- Calibration Summary (page 4-25)
- Straightening the Media Path (page 4-26)
- Linearization (page 4-27)

When to Calibrate

The printer features several types of calibrations. Some should be run routinely, others only when necessary:

When to run	Calibration	Function
When printing a large group of print jobs	**AutoTune** (page 4-4)	Automatic jet maintenance during extended printing periods
When loading a new media (but not when loading a new roll of the same media); after changing the head height	**Media Feed** or media feed adjustment during printing (page 4-9)	Media advance accuracy
	Auto Bidirectional (page 4-6) or **Manual Bidirectional** (page 4-15)	Head calibration, run Manual when calibrating transparent or other media that the onboard digital image sensor cannot calibrate
When loading a new media (but not when loading a new roll of the same media)	**Color calibration** (*System Control User Guide* or third-party RIP manual)	Linearization of colors **Note:** For maximum accuracy, the photodiode must be cooled by its fan before reading color patches. If the left UV curing lamp has been on for longer than 10 minutes, the photodiode cooling fan runs for 12 minutes before taking readings; otherwise the fan runs for 7.5 minutes. The control panel displays a countdown timer while the photodiode is cooling.

AutoJet

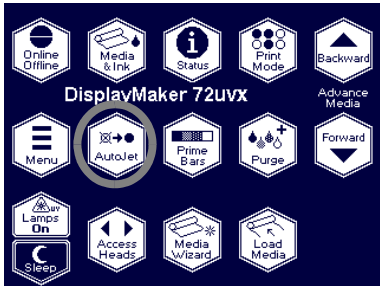
AutoJet detects individual inkjets that are misfiring or not firing at all. During subsequent printing, the printer compensates for these jets by using other jets in their place, ensuring maximum print quality without reducing print speed.

You can also identify and map missing jets manually from the Manual Calibrations menu (see “Manual Jet Mapping” on page 4-18). You may want to manually map weak or misdirected jets that AutoJet does not detect and substitute.

To run AutoJet:

- Press the AutoJet button on the control panel Front Page screen (see page 2-10), or
- Select AutoJet Calibration from the Auto Calibrations menu (see “Auto Calibrations” on page 4-6), or
- Run AutoJet automatically with the AutoTune scheduler (see “AutoTune” on page 4-4)

Note AutoJet does not work with transparent media, nor with many translucent media. In this case, run Manual Jet Mapping.



1. Press the **AutoJet** button from the Front Page screen or select AutoJet from the Auto Calibrations menu.

   The printer asks whether you want to perform a Purge operation. By recovering clogged printheads, you reduce the number of jet substitutions required.

   - Press ▶ to initiate a Purge.
   - Press ✕ to skip the Purge.

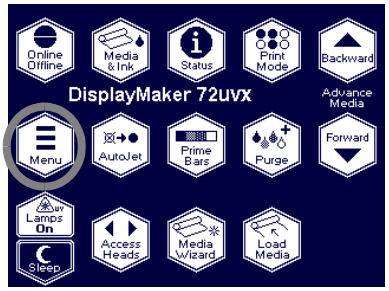
2. The printer prints the AutoJet test pattern.
3. The printer reads the AutoJet test pattern and maps any missing jets to available working jets.

   The control panel shows the progress of this operation as the percentage completed.

4. The printer prints an AutoJet report.

AutoTune

AutoTune runs AutoJet maintenance automatically at intervals you specify. You can use the Quality Check Mode feature to handle AutoJet errors (with or without user intervention). AutoTune is available for roll-fed media only.



1. On the Front Page screen, press the ☰ (Menu) key to enter the menu system.
2. Press the ↷ (Menu In) key display the **Calibrate Printer** menu.
3. Press the ▼ key to highlight **AutoTune.**
4. Press the ↷ (Menu In) key.

   The control panel displays the AutoTune status (off or current interval).

5. Press ▲ or ▼ to set the AutoTune interval.
6. Press ▶ (Proceed).

   The control panel displays a confirmation message:

   Setting completed.

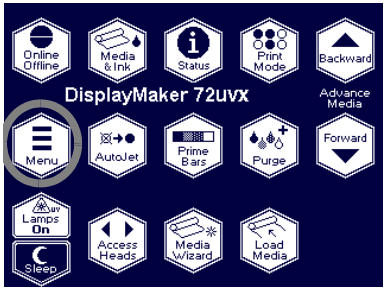
7. Press the ↶ (Menu Out) key repeatedly until the Front Page screen is displayed. Press the Online/Offline button to return the printer to the Ready state.

Note When AutoTune is enabled, it will be executed as scheduled regardless of whether you initiate it manually from the control panel.

Quality Check

When you run AutoJet manually, the software notifies you if there are any jet or alignment problems so that they can be addressed. When AutoTune runs AutoJet at scheduled intervals, you can use the Quality Check feature to handle AutoJet errors.

When Quality Check is enabled, if any missing jets are found that are not substituted by a working jet, or if the BiDi and Media Feed calibrations have not been performed, the operator can be alerted by the control panel or the job can be routed to the Attention queue on the ColorSpan print server.



1. On the Front Page screen, press the ☰ (Menu) key to enter the menu system.

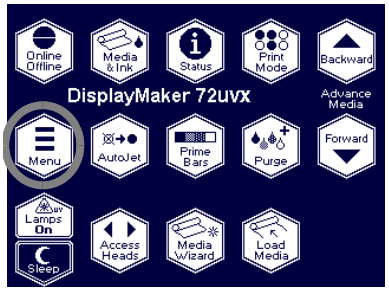
2. Press the ▼ key repeatedly to highlight **Printer Settings.**
3. Press the ↷ (Menu In) key display the **Printer Settings** menu.
4. Press the ▼ key repeatedly to highlight **Quality Check.**
5. Press ▶ (Proceed).

   The control panel displays the Quality Check options.

   - **Attended Mode** — user must press ▶ (Proceed) to acknowledge the error and print the job (if one is pending), or ✕ (Cancel) to cancel printing.
   - **Unattended Mode** — no user acknowledgment of errors is required. When a quality check fails, print jobs are sent to the ColorSpan print server's Attention queue with a disposition of "Uncalibrated Printer" (this feature may not be supported by non-ColorSpan RIPs).
   - **OFF** — no quality check is performed, all jobs will print.

6. Select a Quality Check option.
7. Press the ↶ (Menu Out) key repeatedly until the Front Page screen is displayed. Press the Online/Offline button to return the printer to the Ready state.

Auto Calibrations



The printer's piezo printheads are aligned at the factory and should only occasionally require you to run an automatic bidirectional or head-to-head calibration.

1. On the Front Page screen, press the ☰ (Menu) key to enter the menu system.
2. Press the ↷ (Menu In) key display the **Calibrate Printer** menu.
3. Highlight **Auto Calibrations** and press the ↷ (Menu In) key.
4. Select one of the Auto Calibrations.
   - **AutoBiDi (bidirectional) Calibration** — ensures that every working jet fires at precisely the same location (regardless of the carriage direction of travel).
   - **AutoH2H (head-to-head) Calibration** — ensures that the printheads are in alignment relative to each other.
   - **AutoJet Calibration** — locates and substitutes missing jets for working jets. This is the same calibration performed as when you press the AutoJet button on the Front Page screen (see "AutoJet" on page 4-3).
   - **Full AutoSet** — runs all three calibrations in sequence.

   The printer prints a test pattern then reads it and makes the necessary adjustments or jet substitutions.

   After completing the calibration(s), a report is printed that shows:

   - Calibration results — a summary such as SUCCESSFUL CALIBRATION or an error message
   - Header showing the date and time, software version, and printer type
   - Calibration detail — the calibration data for each head. The AutoJet detail reports how many jets were mapped out by AutoJet, how many are permanently mapped out by the operator, and whether the head is usable (from a jetout standpoint) in the various print modes. The higher quality modes (Production and High Quality) use jet replacement, so they can print successfully with a greater number of jets out than can Billboard mode.

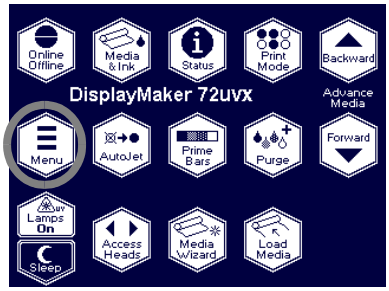
Fig. 4-1. Auto calibration patterns and reports

Manual Calibrations

When you run the calibrations from this menu, you evaluate the calibration test patterns visually and enter the calibration values via the control panel.

Note	The manual BiDi and X head calibrations are time-consuming and can be error-prone, but is necessary when calibrating transparent media or other media that the printer's digital image sensor cannot calibrate.

Before calibrating the printer, first clean the printhead jets. See "Loading Roll-Fed Media" on page 3-14 for tips on detecting and recovering missing jets.



1. Press the ☰ (Menu) key from the Front Page screen on the control panel to display the menus.
2. Press the ↷ (Menu In) key display the **Calibrate Printer** menu.
3. Press the ▼ key to highlight **Manual Calibrations.**
4. Press the ↷ (Menu In) key.

   The Manual Calibration menu consists of these options:

   - **Media Feed** (page 4-9) — eliminates banding between print swaths ("stitch banding") by calibrating media advance.
   - **Manual BiDi Registration** (page 4-15) — the manual version of AutoBiDi Calibration.
   - **Manual X Head Registration** (page 4-12) — the manual version of AutoH2H Calibration.
   - **Manual Jet Mapping** (page 4-18) — the manual version of AutoJet.
   - **Jet Status Lines** (page 4-24) — prints a quick test pattern that shows which jets are out.
   - **Default Registration Data** (page 4-24) — sets all registration data to zero.

   After calibration and jet mapping, perform a linearization or color calibration (as supported by your print server or RIP).

Media Feed

This calibration allows you to calibrate the accuracy of the media advance. Inaccurate media advance can result in blank spaces between print swaths (too much advance) or overlapping swaths (too little advance). The Media Wizard stores this value by media type, and displays a media feed number (MFN), which you can record for subsequent entry.

The media feed number enables you to quickly specify a known good media feed setting without recalibration. For example, you could keep a list of media feed numbers by media type, or by media type and full, half, and nearly empty supply rolls.

Tip You can also adjust the media advance while a print job is printing. Repeatedly press the increase advance or decrease advance button shown on the control panel to eliminate blank spaces or overlap between print swaths. When you do this, the media feed number displayed on the control panel changes accordingly.

1. On the **Manual Calibrations** menu, highlight **Media Feed** (which is highlighted by default).
2. Press the ↷ (Menu In) key to select the option.
   - **Stitch pattern** — First, allow the printer to print the following number of swaths, depending on the mode you want to calibrate:
     - 16 swaths in High Quality mode, or
     - 8 swaths in Production Quality mode, or
     - 4 swaths in Billboard Quality mode

     Next, press the ▲ key to increase the advance until you see blank spaces between swaths.

     Finally, press the ▼ key to decrease the advance until the blank spaces are eliminated, but avoid dark lines between swaths (which indicate overlap). This method allows for the tendency of the media advance to gradually decrease as the size of the supply roll decreases.

     You can pause and resume the printing of the stitch pattern.

- **34-inch (900 mm) calibration** — prints a 34-inch (or 900 mm) test pattern so you can verify its length with an accurate metal ruler. Cut the pattern from the media web, then measure and adjust the media advance as needed until the pattern is exactly 34 inches (900 mm) long.
- **10-inch (250 mm) calibration** — prints a 10-inch (or 250 mm) test pattern so you can verify its length with an accurate metal ruler. This is not as precise as the 34-inch (900 mm) calibration, but it uses less media. Measure and adjust the media advance as needed until the pattern is exactly 10 inches (250 mm) long.

Tip To avoid cutting the 10-inch (250 mm) pattern from the media web, copy the marks from the printed pattern to the long edge of a letter-size (or A4) sheet of paper. Then measure the transferred marks and adjust the media advance as needed until the marks are exactly 10 inches (250 mm) apart.

Tip Run the 34-inch or 10-inch calibration first, then run the stitch pattern version to fine-tune the media advance accuracy.

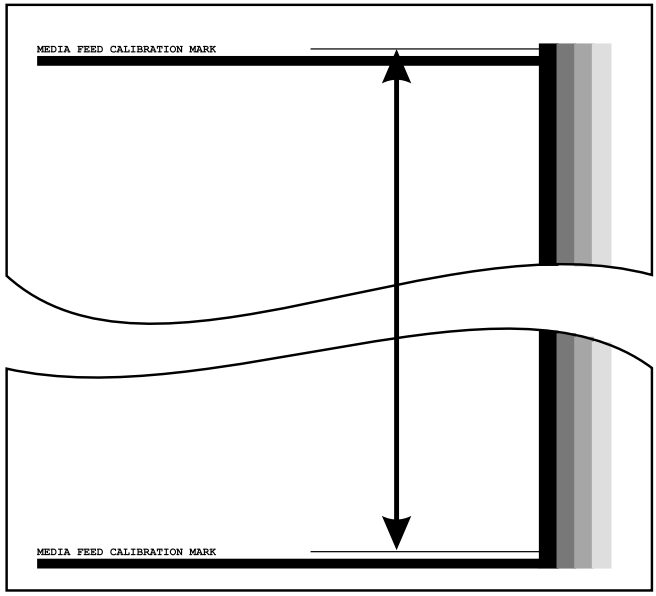


Fig. 4-2. Measure between the calibration marks

- **Input MFN** — enter the Media Feed Number that was displayed after a previous media feed calibration, to return to that setting without performing the calibration again.

Manual X Head Registration

Precise positioning of each drop of ink is essential for optimal print quality. This is possible only if you register all printheads in the printhead assembly to each other in the X (along the length of the platen) direction.

This is a two-part process:

- Print a registration pattern.
- Enter the X registration data for each head.

Note This is the manual version of AutoH2H Calibration (see "Auto Calibrations" on page 4-6 for details).

1. On the **Manual Calibrations** menu, press the ▼ key repeatedly to highlight **Manual X Head Registration.**
2. Press the ↷ (Menu In) key to select the option.

   The control panel asks whether you want to print a manual head-to-head calibration page.

   - If you have a calibration pattern from a recent print, you can use it to calibrate the heads. Press ✕ (Cancel) and go to the next step.
   - If you need to print a new calibration pattern, press ▶ (Proceed). The printer prints a calibration page.

   When the calibration page has printed, the control panel displays this prompt:

   Take readings from left side of pattern.

3. Press the ▶ key.

   The control panel displays this message:

   X Direction Registration
   Head 2: +0

4. Examine the X direction pattern (in the left-hand group of patterns) for the current head, and determine which pattern of colored and black lines are the closest to perfectly aligned.

Use a printer's loupe or magnifying glass if the patterns are difficult to see.

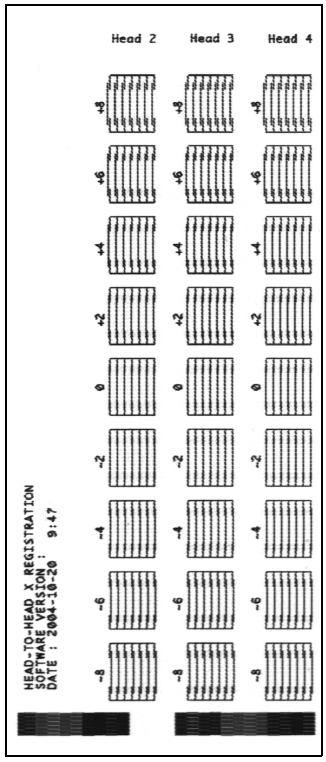


Fig. 4-3. Sample head calibration patterns

5. Press the ▲ or ▼ control panel keys repeatedly until the number next to the pattern that is closest to aligned perfectly is displayed.

   For example, if pattern -1 is the closest aligned, press the ▼ key to change the display to:

   X Direction Registration
   Head 2: -1

   If a printhead is extremely out of alignment, there may be no pattern in alignment. Since the black vertical bars are five pixels apart, you can add +5 or -5 to a pattern number to shift the colored bars up or down by one black bar. Alternatively, you can repeatedly perform the X calibration, which will move the head in smaller increments, until the head is aligned.

6. Press ▶ (Proceed).

   The control panel message increments the head number by one.

7. Repeat steps 4 through 6 for each of the heads.

   When you have entered registration values for all of the patterns, the control panel displays this message:

   Registration successful.

Manual BiDi Registration

Bidirectional registration is a method to align each of the printheads so that dot placement is accurate in both directions along the X axis (along the direction of printhead travel).

The bidirectional registration pattern consists of a series of vertical lines. Half the pixels in this pattern are printed in one direction, half of them in the other direction. When the pixels are accurately aligned, the pattern is clear. When the dots are not aligned, the pattern appears fuzzy and ill-defined.

Note AutoBiDi Calibration is the automatic version of this calibration. Try AutoBiDi first before running this manual calibration (see "Auto Calibrations" on page 4-6 for details).

1. On the **Manual Calibrations** menu, press the ▼ key repeatedly to highlight **Manual BiDi Registration.**
2. Press the ↷ (Menu In) key to select the option.
3. Press ▶ (Proceed).

   The control panel displays this prompt:

   Print a manual bidi registration page?

4. Press ▶ (Proceed).

   The printer prints the calibration pattern you selected.

5. When the calibration page has printed, the control panel displays this prompt:

   Bidi registration
   Head 1: 0

6. Examine the BiDi Registration pattern for the current head, and determine which pattern is the closest to perfectly aligned.

Use a printer's loupe to select the pattern, since the lines in the patterns may be difficult to see.

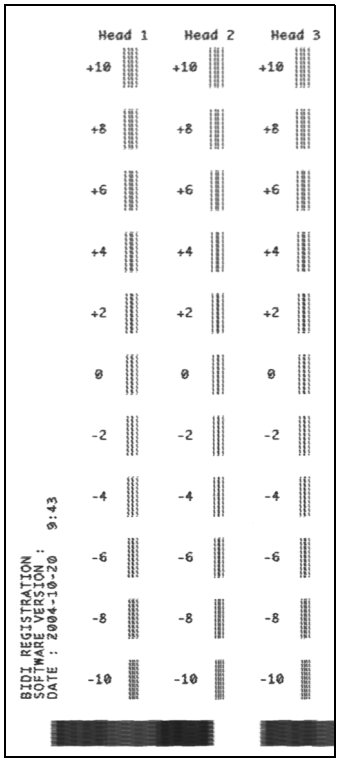


Fig. 4-4. BiDi Registration pattern

7. Press the ▲ or ▼ control panel keys repeatedly until the number next to the pattern that is closest to aligned perfectly is displayed.

   For example, if pattern +2.0 is the closest aligned, press the ▲ key to change the display to:

   Bidi registration
   Head 1: +2

   If a printhead is extremely out of alignment, there may be no pattern in alignment. Since the black vertical bars are nominally five pixels apart, you can add +5 or -5 to a pattern number to shift the colored bars right or left by one black bar. Alternatively, you can perform the BiDi Registration repeatedly, which will move the head in smaller increments, until the head is aligned.

8. Press ▶ (Proceed).

   The control panel message increments the head number by one.

9. Repeat steps 6 through 8 for each of the twelve heads.

   When you have entered registration values for all heads, the control panel displays this message:

   Registration Successful

Manual Jet Mapping

Jets that are missing or misfiring are usually detected by the AutoJet calibration. Alternatively, you can map out jets manually using the Manual Jet Mapping function. You may want to manually map weak or misdirected jets that AutoJet does not substitute.

Tip AutoJet is the automatic version of this calibration (see "AutoJet" on page 4-3 for details).

Tip For best results, print the prime bars and purge the printheads as necessary to ensure the maximum number of working jets. See "Checking Jet Health" on page 3-9 for instructions.

1. On the **Manual Calibrations** menu, press the ▼ key repeatedly to highlight **Manual Jet Mapping.**
2. Press the ↷ (Menu In) key to select the option.

   The control panel displays this message:

   Print Jet Map?

   If you have a calibration pattern from a recent print, you can use it to calibrate the heads. Press ✕ (Cancel) and go to the next step. Otherwise, press ▶.

The printer prints a jet map test pattern.

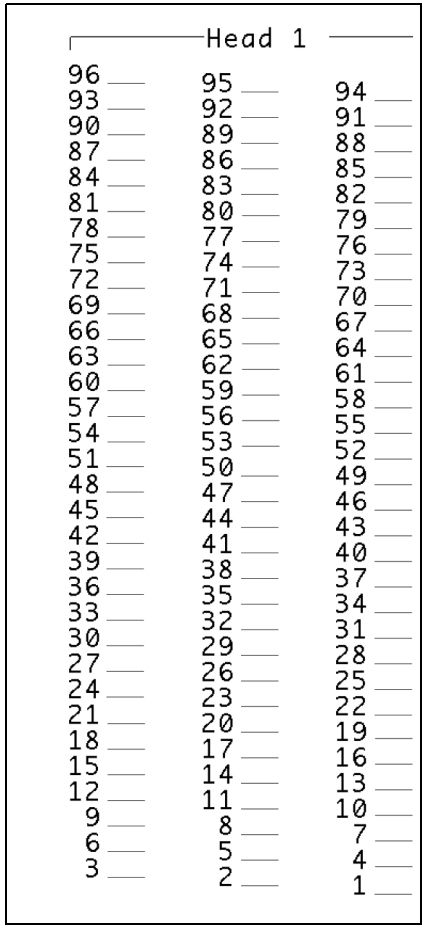


Fig. 4-5. Sample jet mapping pattern (Head 1 of 16)

- If a line segment is missing or broken, the jet number shown next to it is out.
- If a line segment is marked with a code letter:

  R — no replacement
  S — user disqualified “soft” jetout
  H — user disqualified “hard” jetout
  D — disqualified (and replaced) by AutoJet

3. When the calibration pattern has printed, the control panel displays a menu with the following options:

   - **Report individual soft bad jets** — enables you to report a "soft" bad jet, which can be automatically reenabled if AutoJet finds it working.
   - **Report individual hard bad jets** — enables you to report a "hard" bad jet, which will not be checked or reenabled by AutoJet.
   - **Clear individual bad jets** — enables you to clear (mark as good) a jet.
   - **View current bad jets** — lists the bad jets on a given printhead.
   - **Clear all bad jets** — clears (marks as good) all jets currently marked as unusable.

   A "soft" bad jet is a jet that you believe is temporarily out, based on past performance. A "hard" bad jet is a jet that you believe is permanently out.

   Select an option and follow the corresponding procedure below.

Report Individual Bad Jets

When you select Report Individual Bad Jets, the control panel displays the following prompt:

Head 1:
Press Proceed to report a bad jet.

4. Press ▲ and ▼ to select a head number, then press ▶ (Proceed).

The control panel displays a numeric keyboard that you can use to enter the number of the bad jet.

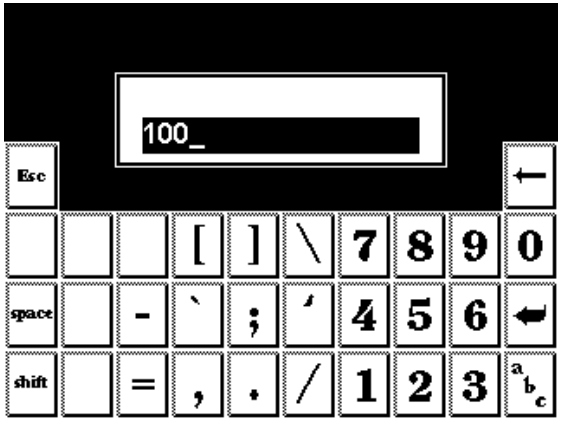


Fig. 4-6. Numeric entry screen

5. Enter the jet number, then press the Enter key.
6. When you are finished entering jet numbers, press the Esc key.

   The control panel displays the head selection message again.

7. Press ▲ and ▼ to select the next head number, then press ▶ (Proceed).
8. Repeat steps 5 through 7 for each head containing bad jets you want to report.
9. When you are finished reporting bad jets, press ✕.

   The control panel displays the previous menu.

Clear Individual Bad Jets

When you select Clear Individual Bad Jets, the control panel displays the following prompt:

Head 1:
Press Proceed to clear a bad jet.

10. Press ▲ and ▼ to select a head number, then press ▶ (Proceed).

    The control panel displays a numeric keyboard that you can use to enter the number of the bad jet.

11. Enter the jet number, then press the Enter key.

12. When you are finished entering jet numbers, press the Esc key.

    The control panel displays the head selection message again.

13. Press ▲ and ▼ to select the next head number, then press ▶ (Proceed).
14. Repeat steps 11 through 13 for each head containing bad jets you want to clear.
15. When you are finished clearing bad jets, press ✕.

    The control panel displays the previous menu.

View Current Bad Jets

When you select View Current Bad Jets, the control panel displays the following prompt:

Head 1:
Press Proceed to view bad jets.

16. Press ▲ and ▼ to select a head number, then press ▶ (Proceed).

    The control panel displays a message that lists the bad jets by number.

17. Press ▶ to return to the head selection screen.
18. Repeat steps 16 and 17 for each head you want to check for bad jets.
19. When you are finished clearing bad jets, press ✕.

    The control panel displays the previous menu.

Clear All Bad Jets

When you select Clear All Bad Jets, the control panel displays the following prompt:

Are you sure you want to clear
ALL reported bad jets?

- Press ✕ to cancel this function, or
- Press ▶ (Proceed). The control panel displays this message:

  Do you want to clear the hard bad jets?

- Press **No** to clear the soft bad jets only.
- Press **Yes** to clear both the hard and soft jets.

The control panel displays this message:

All reported bad jets have been cleared.

20. Press ▶ (Proceed).

When you have finished mapping jets, the following summary appears on the control panel:

x soft jets currently reported bad.
x hard jets currently reported bad.
x new soft bad jets reported.
x new hard bad jets reported.
x previous soft bad jets cleared.
x previous hard bad jets cleared.

where x is the number of jets.

Jet Status Lines

This option prints the Manual Jet Mapping test pattern (see Fig. 4-5 on page 4-19) that shows which jets are working, and which jets are out, but does not run the Manual Jet Mapping calibration (see "Manual Jet Mapping" on page 4-18 for information).

Default Registration Data

This option resets all registration data. Since there is no registration data after running this option, all calibration values must be reestablished by running the calibrations.

Calibration Summary

These options allow you to print a summary of the Full AutoSet calibration, or transmit calibration data to a log file on the print server.

- **AutoSet Summary** — when enabled, a table of the results of the Full AutoSet calibration is printed after the AutoSet test patterns. When you enable the AutoSet Summary, you can show or hide the detailed calibration data.
- **Log Head Registration Data** — sends head registration data to a log file on the print server.
- **Log Jet Data** — sends jet data to a log file on the print server.

Straightening the Media Path

For optimal print quality, the media must feed in as straight a line as possible from the supply to the takeup. This can be accomplished by aligning the sides of the media as straight as possible from supply to takeup, and by smoothing the media web as much as possible before attaching it to the takeup. See “Loading Roll-Fed Media” on page 3-14 instructions.

Printer assembly also affects the media path. If the printer is not assembled to the stand precisely, according to the instructions in Chapter 1, they could be misaligned. This could lead to the media “steering” to the right and left as it is wound onto the takeup spool.

Leveling and stabilizing the stand also helps to straighten the media path:

- Locate the printer on a flat, level surface
- Ensure that all four leveling feet contact the floor and adjust them as necessary to level the printer (or align the printer in a single plane)
- Securely tighten the two silver screws that attach the printer to the stand

For rigid cut-sheet media, the input and output tables must be leveled with the printer platen. For details, see “Using the Media Tables” on page 3-26.

Linearization

As the density of an image varies from highlights to shadows, or from lighter tints to darker tints, the printer should accurately reproduce these areas in a predictable, or linear, fashion. The process of linearization (or color calibration) involves printing and reading color test patches, and calibrating the printer to ensure that the expected and printed densities will match. This in turn will ensure optimal color matching.

You should perform a color calibration when:

- You notice a shift (change) in color output
- Changing media types
- Changing print mode (only if the most precise color matching is required)

Color calibration is a feature of the print server or RIP connected to the printer. Refer to the documentation that accompanies the RIP for further information.

CHAPTER 5

Maintaining the Printer

This chapter describes how to maintain the printer:

- Maintenance Schedule (page 5-2)
- Clean the Rail and Bearings (page 5-4)
- Recover Missing Ink Jets (page 5-7)
- Set the Printhead Height (page 5-11)
- Calibrate the Wiping Position (page 5-14)
- Clean the Wiping Station (page 5-15)
- Replace Ink Filters (page 5-16)
- UV Lamp Operation and Maintenance (page 5-18)
- Clean the Quartz Windows (page 5-21)
- Clean the Ionizer Bar (page 5-23)
- Printhead Procedures (page 5-24)
- Extended Power Down and Restart (page 5-25)

Maintenance Schedule

Task	Description
Interval: Daily	
Daily Startup Procedure	See "Daily Startup" on page 1-8.
Interval: Weekly or as needed	
Clean pinch rollers	Gently dry wipe or blow away dust buildup. **Do not use any fluids to clean the pinch and grit rollers. Deposits of these fluids could form on the print media, causing streaks in printed output.** To remove ink, use a minimal amount of isopropyl alcohol and dry thoroughly before printing again.
Clean carriage rail and bearings (page 5-4)	Inspect for dust buildup, clean if necessary (see "Clean the Rail and Bearings" on page 5-4).
Clean the encoder strip	Inspect for dust buildup, wipe if necessary with SolaChrome UV Printhead Flush, follow with isopropyl alcohol. Encoder must be fully dry before printing. **Cured ink buildup on the encoder strip cannot be removed without damaging the encoder strip. Clean ink spills immediately. If cured ink buildup on the encoder strip causes printing errors, contact your Authorized Service Provider or MacDermid ColorSpan Technical Support for a replacement.**
Clean platen area	Carefully scrape cured ink from the platen using a scraper or razor blade, especially near the right and left edges when printing edge-to-edge.
Interval: As needed	
Clean printheads	See "Checking Jet Health" on page 3-9. To recover jets with a purge and wipe, see "Recover Missing Ink Jets" on page 5-7.
Clean quartz windows	See "Clean the Quartz Windows" on page 5-21.
Calibrate the wiping position (page 5-14)	"Calibrate the Wiping Position" on page 5-14.
Clean ionizer bar	The optional ionizer bar should be cleaned as needed to maintain its effectiveness. See "Clean the Ionizer Bar" on page 5-23.
Interval: At control panel warning	
Replace ink filters (page 5-16)	Replace all four filters as a set, to prevent ink pump failure. The control panel will display a Warning message when 20 liters of ink have passed through the set of filters. You may continue printing past this point, but printhead fill errors may occur.

Task	Description
Replace UV lamp bulbs	The control panel warns you when either of the UV lamp bulbs have been illuminated for 500 hours, but they may be usable for many more hours beyond that point. Bulb life will vary. The bulbs must be replaced when they no longer cure the UV ink sufficiently. See “Replacing UV Lamp Bulbs” on page 5-20.

Clean the Rail and Bearings

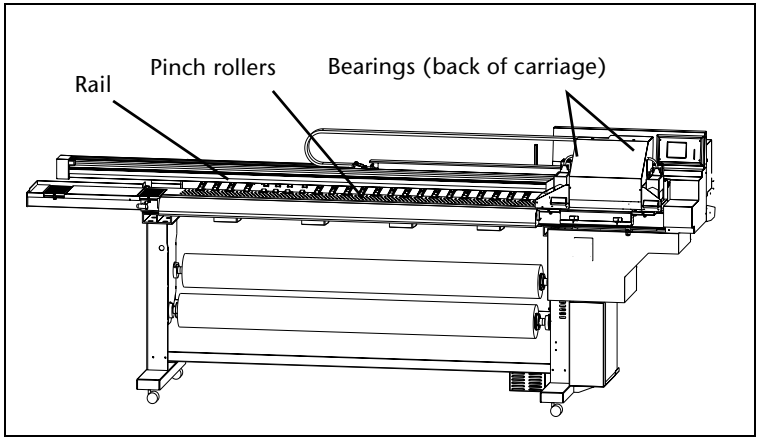


Fig. 5-1. Location of rollers, bearings, and rail

The carriage rail carries the printhead carriage across the width of the platen. As dust and ink accumulates on the rail, the material could accumulate on the carriage bearings (wheels) and cause banding in printed output or noisy ("click-click-click") carriage motion.

Pinch Rollers

1. Wipe the pinch rollers with a lint-free cloth. To remove ink, wipe with a minimal amount of isopropyl alcohol, and dry thoroughly befoer printing again.

Caution **DO NOT ALLOW ISOPROPYL ALCOHOL TO TOUCH THE PRINTHEADS,** especially the inkjet orifice plates. Contact with the ink could cause the ink to coagulate, rendering the printhead unusable and requiring it to be replaced. Be sure that cleaned surfaces have dried before printing.

Rail

2. Wipe the entire length of the rail with a lint-free cloth or wipe moistened with isopropyl alcohol.

   The rail surfaces that must be clean are the surfaces that touch the carriage bearings. These are the top surface, including the front and back of the front lip, and the side surface, behind the belt. Move the carriage manually or press the Carriage key on the control panel Front Page so you can access and clean the entire rail.

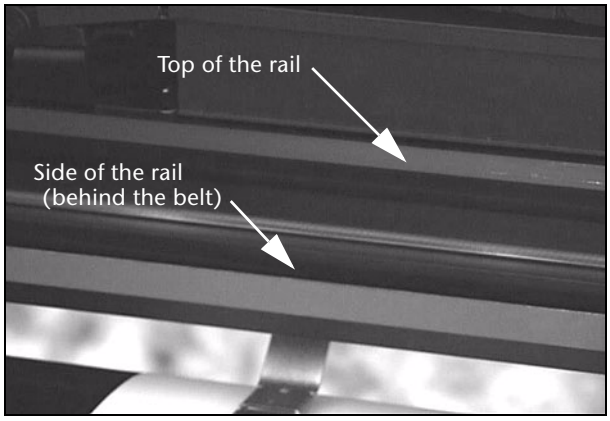


Fig. 5-2. Cleaning the rail

Carriage Bearings

3. From the control panel Front Page screen, press the **Access Heads** key.

   The carriage moves out of the wiping station to the access carriage position. The bearings are on the back of the carriage.

   There are four bearings that should be kept clean, one pair on each end of the carriage. Each pair of bearings rolls along the front and back of the lip on the top of the rail. If any buildup occurs on one of these bearings, banding or other artifacts could appear in printed output. This buildup can range from a fine dust to visible particles.

   The fifth bearing rolls along the lower edge of the rail, behind the belt. Cleaning this bearing is not necessary, since it usually does not get dirty.

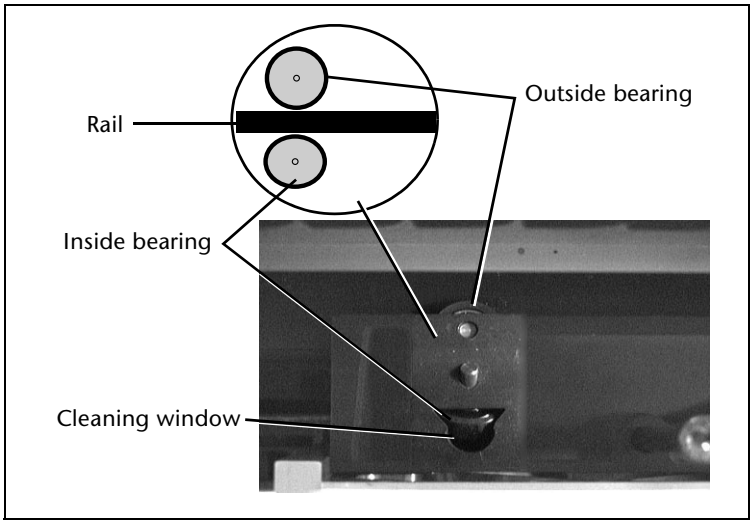


Fig. 5-3. Carriage bearings, left pair shown

4. Clean the left and right outside bearings.

   Moisten a cotton swab with isopropyl alcohol or water, place it against the left side of the bearing, and manually push the carriage to the left. Then place the swab against the right side of the bearing, and manually push the carriage to the right. Repeat once or twice. Remove any large dust particles you see.

5. Clean the left and right inside bearings.

   Insert a moistened cotton swab into the bearing cleaning window, and clean the bearing by manually pushing the carriage to the left and right. Repeat once or twice. Remove any large dust particles you see.

6. Press the ▶ (Proceed) key to return the carriage to the home position.

Recover Missing Ink Jets

The printer is designed to operate with a certain number of missing (clogged or misfiring) inkjets that are substituted by other working jets, without affecting print speed. If your daily startup process (as described in “Daily Startup” on page 1-8) fails to revive all missing jets, you can try the following advanced jet recovery measures.

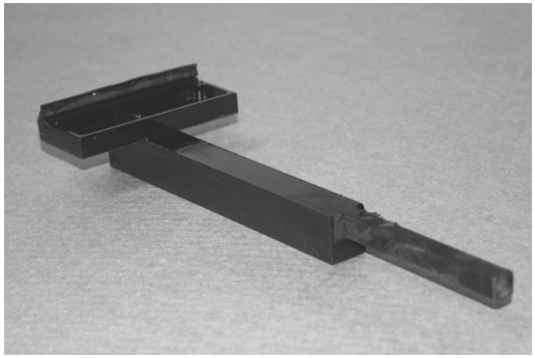


Fig. 5-4. Printhead wiper

1. Select **Perform an Air Purge** from the menu (**Menu > Maintenance > Perform an Air Purge**).
2. From the control panel, select a color, a combination of colors, or all colors to purge.
3. Select **Performance Purge.**
4. The carriage moves out of the wiping station.
5. Open the wiping station cover.

Tip You may wish to wear gloves during this procedure to prevent staining your hands with ink.

6. Press the ▶ (Proceed) key.

   The carriage returns to the wiping station and purges the color(s) that you selected.

7. Wipe the printheads by inserting the printhead wiper carefully into the wiping station channel under the printheads you purged, lift up on the handle slightly, and pull it out straight and level side-to-side (see ❷ in Fig. 5-5 below).

Note Do not wipe the printheads repeatedly; this could result in lost jets.

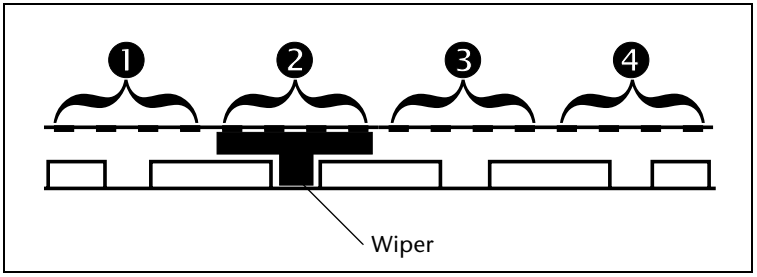


Fig. 5-5. Wiping the printheads

Caution Purged printheads must be wiped *before* printing or moving the carriage across the platen. Moving the carriage with wet printheads will cause uncured (wet) ink to drop onto the platen and louvers. The ink will smoke if it contacts heated louvers.

Tip If the printheads are not centered above the wiper, perform a Wiping Position calibration (see "Calibrate the Wiping Position" on page 5-14).

8. Repeat the previous step in positions ❶, ❷, ❸, and ❹ as needed (see Fig. 5-5 on page 5-8).
9. Clean the wiper with a lint-free cloth, moistened with SolaChrome UV Printhead Flush.

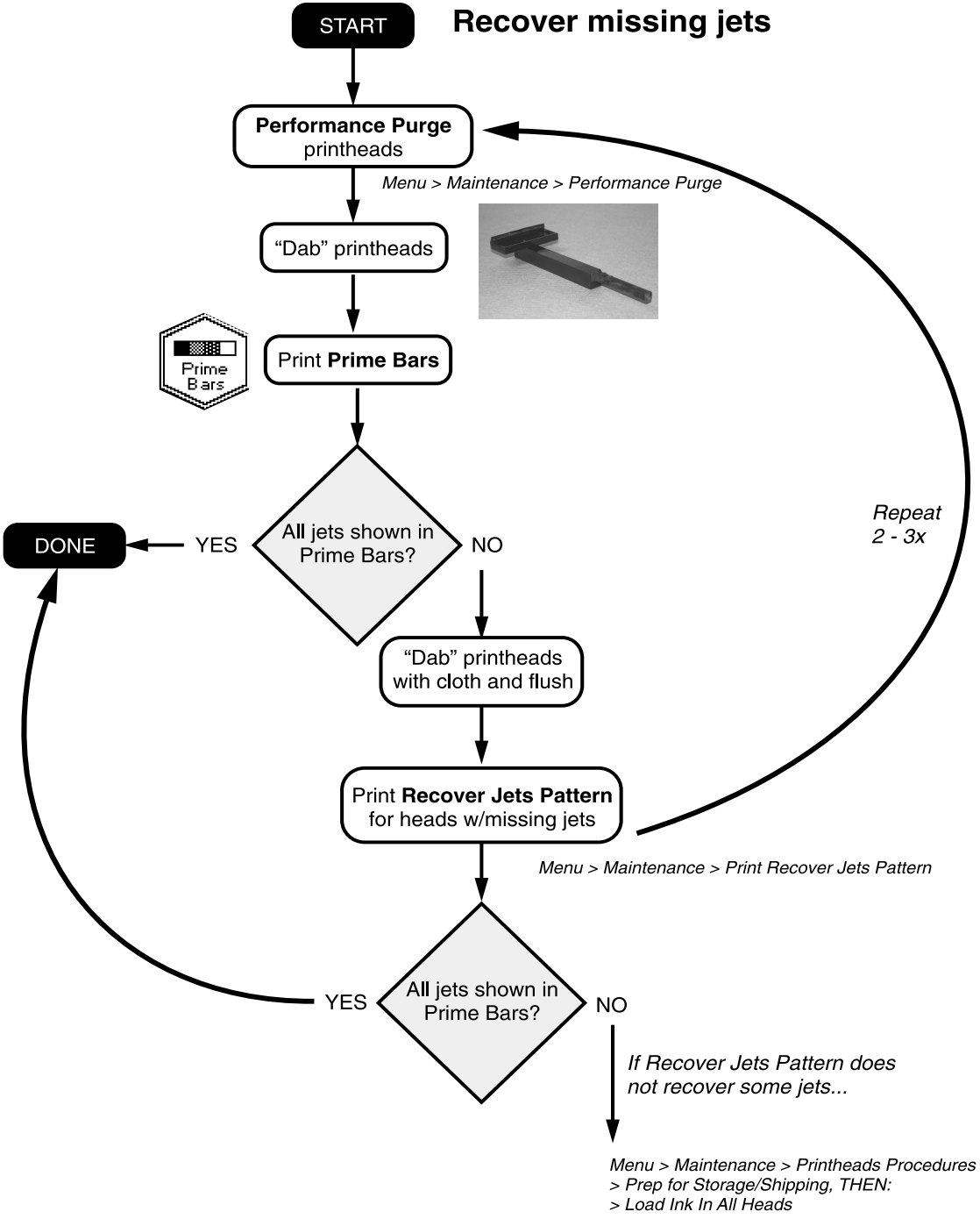
   Do not use a paper towel, which could shed fibers that could clog the inkjets.

10. The carriage moves out of the wiping station.
11. Close the wiping station cover.
12. The carraige moves back into the wiping station.
13. Print the **Prime Bars.**
    - If all jets (indicated by a printed line) are working, the printer is ready to print.

14. If the **Prime Bars** show any missing jets, dab only the printheads that have missing jets with a lint-free cloth moistened with SolaChrome UV Printhead Flush:
    - Remove the parking station from the end of the printer.
    - From the Front Page, press the **Access Heads** key.
    - Gently dab the printhead with a blotting motion. **Do not wipe the printheads.**
    - Press the **Access Heads** key again to return the carraige to the wiping station.
    - Reinstall the parking station and retaining pin.
15. Print the **Recover Jets Pattern** for those printheads with missing jets (or select all printheads).

    After printing this pattern, the prime bars are printed again.

    - If all jets (indicated by a printed line) are working, the printer is ready to print.
    - If there are any missing jets, repeat steps 1 through 15 two or three times until all jets are working.
16. Print the **Prime Bars.**
    - If all jets (indicated by a printed line) are working, the printer is ready to print.
    - If the Prime Bars still show missing jets, map them out (see "Manual Jet Mapping" on page 4-18) or contact MacDermid ColorSpan Technical Services for further instructions.


START
Recover missing jets
Performance Purge printheads
Menu > Maintenance > Performance Purge
"Dab" printheads
Prime Bars
Print Prime Bars
All jets shown in Prime Bars?
YES
DONE
NO
Repeat 2 - 3x
"Dab" printheads with cloth and flush
Print Recover Jets Pattern for heads w/missing jets
Menu > Maintenance > Print Recover Jets Pattern
All jets shown in Prime Bars?
YES
NO
If Recover Jets Pattern does not recover some jets...
Menu > Maintenance > Printheads Procedures
> Prep for Storage/Shipping, THEN:
> Load Ink In All Heads

Set the Printhead Height

The height of the printheads above the media is key to optimal print quality and printer operation. When printing with the wide range of media thicknesses supported bythe printer, it is important to set the head height appropriately. Raising the head height too far will increase the amount of ink overspray. Lowering the head height too far may result in less overspray, but will increase the chance that the printheads will strike the media.

For best results, use the supplied gauge to set the head height above the media loaded on the printer. The gauge sets the printheads 0.085 inches above the loaded media (0.070 inches between the protective frame on the carriage and the media).

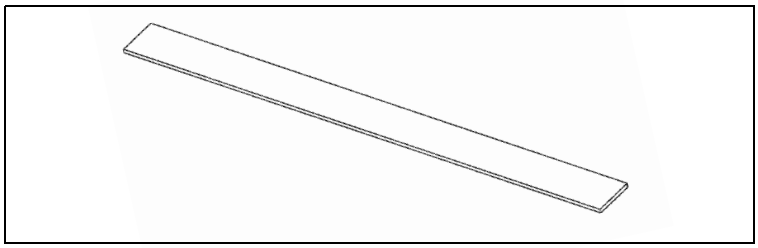
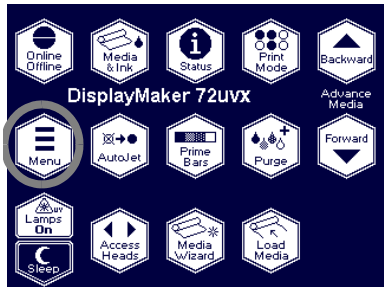


Fig. 5-6. Head Height Gauge



1. Load the media you want to calibrate.

   For instructions, see “Loading Roll-Fed Media” on page 3-14 or “Loading Rigid Media” on page 3-27.

2. On the Front Page screen, press the ☰ (Menu) key to enter the menu system.
3. From the control panel menu, press the ▼ key to highlight **Printer Settings.**
4. Press the ↷ (Menu In) key.
5. From the Settings menu, press the ▼ key repeatedly until **Head Height** is highlighted.
6. Press the ↷ (Menu In) key.

   The carriage moves out over the platen.

7. Place the gauge next to the carriage.

   You may insert the gauge from the sides or the front of the carriage. Note that you will be measuring to the bottom of

the printheads, not to the bottom of the UV lamp assemblies (see Fig. 5-7 below).

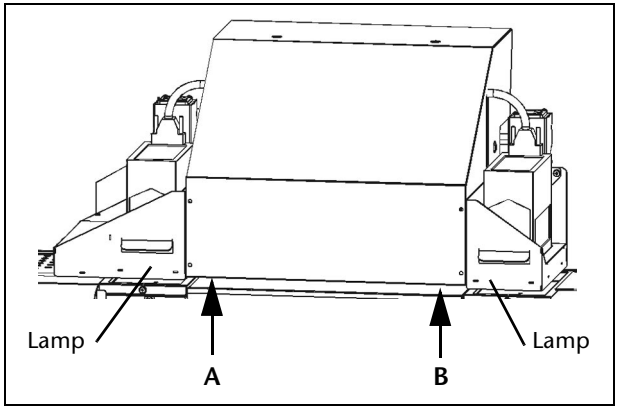


Fig. 5-7. Head height measurement points A and B

8. Use the supplied hex wrench to turn one of the head height adjustment screws counterclockwise until the end of the gauge will *not* fit under the carriage.

   The head height adjustment screws can be accessed from the top of the carriage. The access holes are labeled with a white circular label.

Caution Do not allow any part of the gauge to touch the printheads, and do not leave the gauge on the platen after setting the head height. If the gauge is allowed to touch or strike the printheads, the printheads could be damaged permanently and require replacement. The printer has a protective frame around the printheads to reduce the chance of anything striking them.

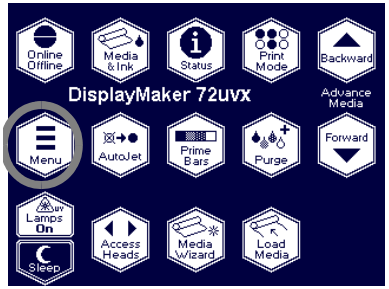
9. Turn the head height adjustment screw clockwise, just until the end of the gauge slides under the carriage.
10. Remove the gauge and repeat steps 7 through 9 at the other side of the carriage.
11. Verify the heights at both sides of the carriage and adjust if necessary.
12. Press ▶ to return the carriage to the wiping station.

The control panel displays a message asking whether you want to perform a bidirectional (bidi) calibration.

13. Press ✓ to perform a bidi calibration, or ✕ to continue.

Note	To lower or raise the printheads without measuring with the gauge, use two hex wrenches to turn the head height adjustment screws (at the top of the carriage) simultaneously and by the same number of turns (or fractions of a turn).

Calibrate the Wiping Position



Wiping position calibration enables you to properly align the printheads to the wiper. When properly aligned, the printheads should be centered over the wiper when it is inserted into each wiping station channel.

1. On the Front Page screen, press the ☰ (Menu) key to enter the menu system.
2. Press the ▼ key repeatedly to highlight **Settings.**
3. Press the ↷ (Menu In) key display the **Settings** menu.
4. Press the ▼ key repeatedly to highlight **Wiping Position.**
5. Press the ↷ (Menu In) key.

   The control panel prompts you to confirm that you want to calibrate the wiping station wiping position.

6. Press ▶ (Proceed).

   The control panel displays right and left arrow buttons. When you press these buttons, the carriage moves in the corresponding direction. You may want to use a flashlight and insert the wiper to help you to center the four printheads with the wiper (see ❷ in Fig. 5-8 below).

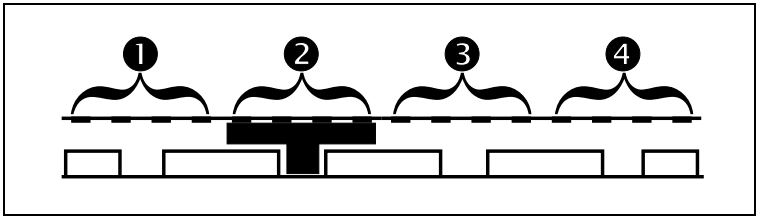


Fig. 5-8. Wiping station alignment

7. When the carriage is properly positioned, press the ✓ key to save the calibration.
8. The control panel confirms that the new position has been saved.
9. Press the ▶ (Proceed) key.

Clean the Wiping Station

1. Open the wiping station door, remove the wiping station cover, and scrape the cured ink with the scraper supplied with the printer (or a putty knife) into a trash receptacle.

   Cured ink is not hazardous waste. If uncured ink is present on the cover, allow further printing to occur with the cover in place to cure the ink.

2. Print with the wiping station cover removed to cure ink in the wiping station.
3. Scrape cured ink out of the station (the wiping station cover makes a good tray) and into a trash receptacle.

   Do not scrape cured ink into the waste ink drain area.

4. Replace the wiping station cover.
5. Open the drain valve to drain uncured waste ink from the bottom of the wiping station into an open container, and allow it to cure before disposal.
6. Close the drain valve.

Replace Ink Filters

The control panel displays a Warning message on the control panel when 20 liters of ink has passed through the filters. Replace all four the filters as a set is recommended. Failure to replace the filters will eventually cause the filters to clog and prevent ink from reaching the printheads.

Have a paper towel ready to catch the small amount of ink that will spill out of some of the tubes and the filter itself as you disconnect them. The drip shelf is designed to catch these spills for easier cleanup. You may also want to wear protective gloves during this procedure.

1. Disconnect the tube from the ink box.
2. Remove the ink box from the shelf.
3. Use a Phillips screwdriver to loosen the filter clamp.

   See Fig. 5-9 for location.

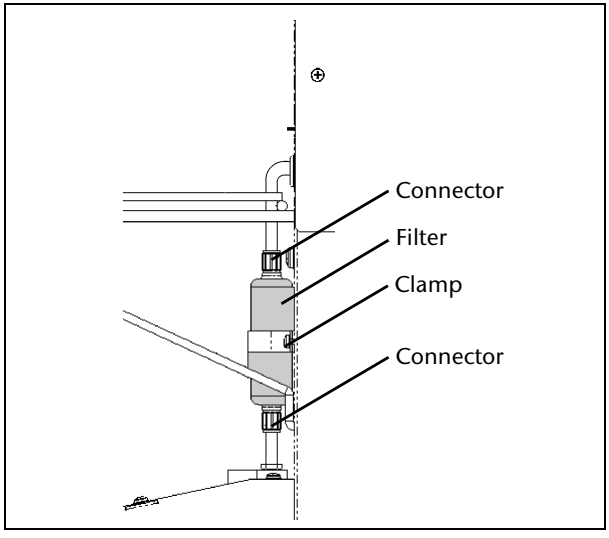


Fig. 5-9. Filter connections

4. Unscrew the hose connectors from filter.

   See Fig. 5-9 for location.
5. Remove the old filter.
6. Install the new filter into the filter clamp.

The filter's label has an arrow that indicates the direction of flow. Install the filter with the arrow pointing up.

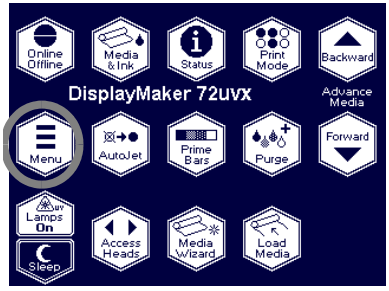
7. Tighten the filter clamp.

   The filter should be secure, but do not overtighten the screw.

8. Connect the hoses to the top and bottom of the filter, and tighten the connectors.
9. Reconnect the ink tube to the ink box.

   See "Loading Ink" on page 3-11 for instructions.

10. Replace the ink box.



11. On the Front Page screen, press the ☰ (Menu) key to enter the menu system.
12. Press the ▼ key repeatedly to highlight **Maintenance.**
13. Press the ↷ (Menu In) key display the **Maintenance** menu.
14. Press the ▼ key repeatedly to highlight **Reset Reservoir Filters.**

    If you are not replacing the entire set of filters, you can reset the count for an individual filter.

15. Press the ↷ (Menu In) key.

UV Lamp Operation and Maintenance

For an overview of the UV lamp system, see “UV Lamp Overview” on page 3-3.

This section covers the following topics:

- Operating Tips (page 5-19)
- Replacing UV Lamp Bulbs (page 5-20)
- Balancing Lamp Hours (page 5-20)

WARNING UV light hazard. Excess exposure to high-intensity UV light can result in photokeratitis (also known as snow blindness or welder’s flash). **AVOID LOOKING DIRECTLY AT THE UV LIGHT.**

VORSICHT UV Licht hoher Intensität. Bitte vermeiden Sie es, direkt in die Lampen zu schauen.

Caution Failure to allow the lamps to cool down properly will damage the lamps. If you disconnect the power cable from the back of the printer or disconnect the green power cable from the lamp assembly before the cool down sequence has finished, you will damage the lamps.

Operating Tips

You can extend the life of the UV lamp bulbs as follows:

- If the head height is significantly above the standard height over the media, the curing effectiveness of the lamps will be reduced. Use the supplied head height gauge to set the head height for the media you are using.
- When the lamps do not cure output sufficiently in Billboard Quality Mode, switch to Production Quality Mode. When the lamps do not cure the output in Production Mode, switch to High Quality Mode **(Front Page > Print Mode)**.
- If the lamps are not curing the ink with the lamps set to Low, increase the setting to Medium or High **(Front Page > Media Wizard)**.
- Check the quartz windows and clean them if necessary (see "Clean the Quartz Windows" on page 5-21 for instructions).

If the lamps are still not curing printed output after taking these steps, contact MacDermid ColorSpan Technical Services for assistance in diagnosing the problem. The technician may be able to suggest further steps to extend the service life of the bulbs.

If directed by Technical Services, expose and return a UV intensity label, supplied with the printer. The label changes color as it is exposed to the UV light from the lamps. By analyzing the label, Technical Services can determine whether the printer's lamps are operating within specifications.

Replacing UV Lamp Bulbs

The UV lamp bulbs will gradually lose their intensity and therefore their ability to cure the ink. The control panel will display a warning message when one or both of the bulbs have been operated for 500 hours, but the bulbs may continue to cure printed output for up to 1000 hours. To view the number of hours that each lamp has operated, advance to the Status page where this listed **(Front Page > Status > Forward)**.

Replacing the bulbs as a pair is recommended. If the total operating time for the right and left bulbs is significantly different, printing artifacts may be visible due to uneven ink curing. When you replace the bulbs, be sure to reset the operating time counter **(Menu > Maintenance > Reset UV Lamp Hours)**.

Refer to the instructions that accompany the replacement bulbs for a detailed procedure for replacing the lamps.

Note The UV lamps contain heavy metals and other elements that should be disposed of as hazardous waste. They should be taken by any hazardous waste service or facility that accepts mercury lamps.

Balancing Lamp Hours

If you do an extensive amount of unidirectional printing, or otherwise print with only one lamp, the lamps' different hours of service will eventually cause the lamps to cure ink differently and reach end-of-life at different times. This would result in ink curing anomolies.

To avoid this, switch between left-only and right-only printing as needed to equalize the lamp hours. (See "Selecting a Print Mode" on page 3-5 for instructions.)

The printer software will display a Warning message if the difference between the right and left lamps' service hours exceeds 300, but you can display the lamp hour counts at anytime by pressing the **Status** key on the Front Page, and advancing to the page where the number of hours are listed.

Clean the Quartz Windows

The quartz windows protect the UV lamp cartridges from ink, media, and environmental dust. They should be checked periodically for dust buildup, which reduces the curing efficiency of the UV lamps.

WARNING UV light hazard. Excess exposure to high-intensity UV light can result in photokeratitis (also known as snowblindness or welder's flash). AVOID LOOKING DIRECTLY AT THE UV LIGHT.

VORSICHT UV Licht hoher Intensität. Bitte vermeiden Sie es, direkt in die Lampen zu schauen.

Caution Avoid depositing skin oils onto the quartz windows. Skin oils left on the quartz windows could cause the windows to shatter when heated.

Note If the quartz window is becoming opaque (devitrification) or is chipped, cracked, or cannot be cleaned, then it should be replaced to ensure that the ink can be cured.

To perform this procedure, you will need

- Protective gloves and safety glasses
- Lint-free (cleanroom) cloths
- SolaChrome UV Printhead Flush in small squirt bottle
- Non-metallic scouring pad or razor blade scraper

1. **ALLOW THE LAMPS TO COOL COMPLETELY BY FINISHING ALL PRINTING, AND WAITING FOR AUTOMATIC SHUTOFF OR PRESSING THE "LAMPS OFF" BUTTON ON THE CONTROL PANEL.**

   Do not perform this procedure when the lamps are on or have not cooled completely.

2. Remove the UV parking station from the printer.

3. Remove the right-hand louvers from the left end of the printer.
4. From the Front Page screen of the control panel, press the **Access Heads** key.

   The printhead carriage moves to the access position at the left end of the printer. You will now be able to access the left and right quartz windows from below the carriage.

5. Moisten a lint-free cloth with SolaChrome UV Printhead Flush, and wipe the quartz plates to moisten, soften, and remove the cured ink and dust.

   Any ink and dust present will be very hard cured, so you may need to allow the buildup to soak. Then scrub with a non-metallic scouring pad (to avoid scratching the window), or scrape with a razor blade scraper.

6. After all of the ink and dust has been removed, wipe the quartz windows clean with a lint-free cloth moistened with SolaChrome UV Printhead Flush.
7. With a new lint-free cloth, dry-polish the quartz windows to ensure that no smearing or residue remains.
8. From the Front Page screen of the control panel, press the **Access Heads** key.

   The printhead carriage moves back to the wiping station.

9. Reinstall the louvers.
10. Reinstall the UV parking station.

Clean the Ionizer Bar

If your printer has the optional ionizer bar installed, you should clean it as needed to maintain its efficient operation. The ionizer bar cannot eliminate static charges if it is dirty or if its cable is not securely connected.

A buzzing noise at the ionizer bar, and a flickering of the orange neon bulb at the right end of the bar, indicates reduced ionizer efficiency. This may be due to oxidation or buildup on the titanium pins, lack of a good earth ground, or an incomplete cable connection.

To clean the titanium pins along the length of the ionizer bar:

1. Switch off power to the ionizer bar.
2. Verify that the cable connected to the right side of the ionizer bar (when facing the rear of the printer) is fully seated and completely threaded into position.
3. Use an ohm meter to measure the resistance between the metal electronics assembly and the metal bars that run the length of the ionizer bar.

   The measurement should be less than 1 ohm after subtracting the resistance of the test leads. If so, no cleaning is necessary. Go to step 5.

4. Brush the titanium pins with a soft metal bristle brush (part number 0602665).
5. Switch on power to the ionizer bar.

   If the pins are clean, there will be no buzzing sound, and the orange light will remain off; otherwise, repeat this procedure.

Printhead Procedures

The printer uses air pressure to both fill and evacuate ink and printhead flush from the printheads. The following functions are available from the menu at **Maintenance > Printhead Procedures:**

- **Load Ink In All Heads** — when installing ink for the first time, or when restarting the printer after an extended power down period, this function fills the empty printheads with ink.
- **Fill Heads with Ink** — fills the printheads with ink, one color at a time. Should only be done with empty printheads.
- **Empty Heads (Fill With Air)** — empties all printheads by using air pressure.

The wiping station has a waste tray that drains to a valve at the front of the printer. As you perform Printhead Procedures from the menu, monitor the ink and solvent level in the waste tray. Drain the ink into a container occasionally to prevent overflows. Since this mixture of ink and printhead flush will not cure, dispose of it according to the instructions in the Material Safety Data Sheets for the ink and printhead flush.

Extended Power Down and Restart

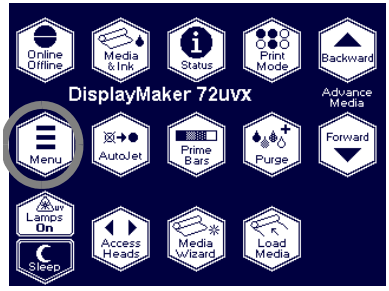
UNDER NORMAL OPERATION, DO NOT POWER DOWN THE PRINTER. Constant vacuum at the printheads is required to prevent ink from running out of the printheads. Also, power must not be removed suddenly from the UV lamp system; permanent damage to the lamps could occur if hot lamps are not cooled according to specifications.

If the power must be removed for a brief period of time, you can leave the carriage over the wiping station to allow the ink, which will no longer be held inside the printheads by the vacuum/pressure system, to drain onto the wiping station cover plate.

Optionally, you can maintain power to the vacuum system by using the auxiliary 24 volt power supply. This will prevent ink from running out of the printheads. If the printer will be powered down for an extended period, follow the procedure below.

Power Down

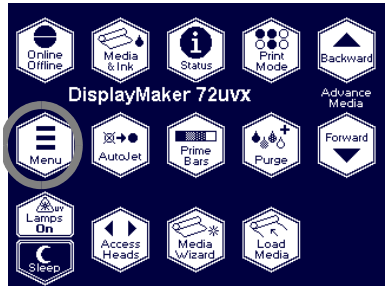
If it is necessary to power down the printer for an extended period, for example in order to store or ship it, follow this procedure:



1. Unload media, if any is loaded (see "Unloading and Cutting Roll-Fed Media" on page 3-21).
2. On the Front Page screen, press the ☰ (Menu) key to enter the menu system.
3. Press the ▼ key repeatedly to highlight **Maintenance.**
4. Press the ↷ (Menu In) key display the **Maintenance** menu.
5. Press the ▼ key repeatedly to highlight **Prep for Storage/ Shipping.**
6. Press the ↷ (Menu In) key.
7. Follow the prompts on the control panel to finish this procedure.

Restart

To restart the printer, follow the procedure below.



1. Switch the power switch to the on position.
2. On the Front Page screen, press the ☰ (Menu) key to enter the menu system.
3. Press the ▼ key repeatedly to highlight **Maintenance.**
4. Press the ↷ (Menu In) key display the **Maintenance** menu.
5. Press the ▼ key repeatedly to highlight **Load Ink in All Heads.**
6. Press the ↷ (Menu In) key.
7. Load media.

   See “Loading Roll-Fed Media” on page 3-14 for instructions.

8. Recover missing jets.

   See “Checking Jet Health” on page 3-9 for instructions.

APPENDIX A

Technical Specifications

This chapter lists the printer's specifications and information about ordering supplies.

Specifications

General

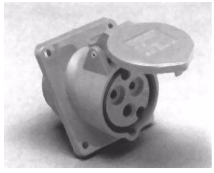
	DisplayMaker 72UVX	DisplayMaker 98UVX
Dimensions (Assembled)	Height: 52.5 inches (133.4 cm) Depth without tables: 33.0 inches (83.8 cm) Depth with tables: 87.7 inches (222.8 cm) Width: 133.0 inches (337.8 cm)	Height: 52.5 inches (133.4 cm) Depth without tables: 33.0 inches (83.8 cm) Depth with tables: 87.7 inches (222.8 cm) Width: 159.0 inches (404 cm)
Weight (Assembled)	Without tables: 375 pounds (170 kg) With 2 tables: 500 pounds (227 kg)	Without tables: 425 lbs. (193 kg) With 2 tables: 580 lbs. (263 kg)
Supported Media Widths	24-73 inches (61-185 cm)	24-98.5 inches (61-250 cm)
Maximum Media Thickness	0.50 inch (12.7 mm)	
Operating Conditions	Safety: CE Temperature: 68–95° F (20–35° C) Relative Humidity: 20–80%, non-condensing	
Approvals	Emissions: FCC-A, CE, VCCI-1 Immunity: CE	

Electrical Power

Power used: 200-240VAC, 50/60 Hz, 16 Amps maximum

Required electrical circuit:
220 VAC, 20 Amps, with NEMA L6-20R locking wall receptacle (North America and Japan),
OR
220 VAC, 16 Amps, single phase, with IEC 60309 wall receptacle (Europe)

NEMA L6-20R
locking wall receptacle
(North America/Japan)



IEC 60309
wall receptacle
(Europe)

North America: If your building receives power from a standard three-phase supply, note that the printer will use only two of the three phases. This means that your building's three-phase power transformer may have an unbalanced load. Check with your electrician to verify that your building has sufficient capacity for this unbalanced load.

Optional auxiliary power for vacuum system:
Supplied 24 volt DC power supply with universal adapters, connected from the 24 VDC jack on the vacuum/pressure assembly to either of two options:
1. UPS — customer-supplied uninterruptible power supply, output 100-240 VAC, 50/60 Hz, minimum of 15 watts of power, provides battery backup to the vacuum system in the event of a power failure.
2. Wall outlet — 100-240 VAC, 50/60 Hz, provides temporary power to the vacuum system when it is necessary to power down the printer for service.

Required power cord (supplied with printer):
North American (UL/CSA approved), length 8.2 feet (2.5 m), **OR**
European (Harmonized), length 8.2 feet (2.5 m)

Performance

Printing Technology	16 piezo-electric inkjet printheads utilizing Micro-Quad™ Jet Technology.
Resolution	600 x 600 dpi, 600x300 dpi (as supported by the RIP or ColorSpan print server)
Ink	SolaChrome™ 4-color (CMYK) flexible UV cure inks, off-head ink system.
Curing System	Dual carriage-mounted 500-watt UV lamps.
Print Speeds (bidirectional) @ 72 inches wide *Unidirectional modes (right-only or left-only) print in approximately half the speed of the corresponding bidirectional modes.*	
Billboard Mode (600x600 dpi)	400 ft^2 (37.2 m^2)/ hour
Production Mode (600x600 dpi)	200 ft^2 (18.6 m^2)/ hour
with Fine Text	100 ft^2 (9.3 m^2)/ hour
with Sharp Edge	160 ft^2 (14.9 m^2)/ hour
Production Mode (600x300 dpi) *(Requires mode-specific color profiles)*	400 ft^2 (37.2 m^2)/ hour
High Quality Mode (600x600 dpi)	100 ft^2 (9.3 m^2)/ hour
with Fine Text	50 ft^2 (4.6 m^2)/ hour
with Sharp Edge	80 ft^2 (7.4 m^2)/ hour
Vacuum/Pressure System	Maintains negative relative pressure at the printheads and provides air pressure for purging. Nominal relative vacuum: 5.0 inches H_2O Since relative pressure is maintained, the printer can be operated at various altitudes above or below sea level without adjustments to the system.
Media Handler	Supply and takeup for roll-to-roll handling; use of takeup is optional. Supply accepts 3-inch or 2-inch cores, takeup accepts 3-inch cores only. The supply-takeup system can support rolls of up to approximately 125 pounds (56.7 kg). The media supply roll can be loaded and unspooled in either orientation for printing on either side. Rigid media: front and rear roller tables support rigid materials up to 60 inches (152 cm) long. A second set of tables can be added to support rigid materials up to 120 inches (305 cm) long.

Software Features	Touch screen LCD with graphical interface. Automatic calibration and detection/substitution of missing jets. Media Wizard stores operational parameter sets by media type for subsequent recall. Automatic edge detection and media positioning.

Supplies and Accessories

Consult MacDermid ColorSpan or your MacDermid ColorSpan representative for an updated listing of supported ink and media.

Use only genuine ColorSpan SolaChrome inks and printhead flush in the printer. Use of any other inks or cleaning fluids could damage the printer and will void the warranty.

Supplies and accessories are available from MacDermid ColorSpan by calling:

MacDermid ColorSpan Supplies Sales

- North America: (800) 723-3002 or (952) 943-3636
- Europe: +31 23.5622000
- Asia: (952) 943-3300
- Latin America: (800) 664-7242 or (952) 943-3600

APPENDIX B

Troubleshooting

This appendix explains how to prevent and diagnose printing problems and provides information about getting help from ColorSpan.

For other software-specific troubleshooting procedures, refer to your application software documentation or the other ColorSpan documentation listed on page vi of this manual.

If your printer is connected to a non-ColorSpan RIP or print server, refer to the accompanying third-party documentation.

- Troubleshooting Checklist (page B-2)
- Warranty Claims (page B-6)
- Diagnostics (page B-8)
- MacDermid ColorSpan Technical Services (page B-9)

Troubleshooting Checklist

Before you troubleshoot your printer, make sure that it is properly installed as described in Chapter 1, Getting Started.

Follow the steps in this checklist to isolate and resolve printing problems.

1. Does the printer's power come ON?

   YES: Go to question 2.
   NO: The following could be the problem:

   - The power cable may not be plugged into an electrical outlet.
   - If the printer is plugged into a surge protector, the surge protector may not be connected to power, or it may be switched off.

2. Did the start-up sequence of the control panel end by displaying a Ready (status) screen similar to the one shown in Fig. 2-1 on page 2-2?

   YES: Go to question 3.
   NO: The following could be the problem:

   - There may be a hardware problem with the printer's internal components. Follow the diagnostic routine on the control panel to determine the problem. Call MacDermid ColorSpan Technical Services as directed by the control panel.

3. Can you send a file from the print server to the printer?

   YES: Go to question 4.
   NO: The following could be the problem:

   - The cable may not be securely connected between the print server and the printer. Refer to the server's documentation for more information.
   - The cable may be connected to the wrong port on the print server. Refer to the server's documentation for more information.

4. Can you send (print or download) a document from a client computer to the server?

   YES: Go to question 5.
   NO: The following could be the problem:

   - The connection from the client to the local area network may not be configured correctly. See your system administrator for assistance.

- The cable between your computer or network and the print server may not be securely connected at both ends. Refer to the print server manual for more information.
- Your computer may not be working properly. Run an application that you know works correctly and print to be sure.
- The computer's port may not be working properly. Print to another output device that you know works correctly (and is not connected to the print server) to check this.
- There may be another error condition reported by the print server.

5. Is the print quality good?

   YES: Then the problem is not covered in this checklist. Contact MacDermid ColorSpan Technical Services.
   NO: The following could be the problem:

   - **Banding or general poor image quality** — the printheads may need to be calibrated (see Chapter 4, Calibrating the Printer). One or more inkjets may be clogged or not firing (see "Loading Roll-Fed Media" on page 3-14). The media advance may need to be recalibrated (see "Media Feed" on page 4-9). Verify that the printhead carriage is at the proper height (see "Set the Printhead Height" on page 5-11). Verify that the service station is calibrated (see page 5-14).
   - **Inaccurate color or under- or over-saturated output** — the wrong color profile may be selected at the print server or RIP. Refer to the documentation that accompanies the print server or RIP.
   - **Inaccurate color or lack of detail** — one or more inkjets may be clogged or not firing (see "Loading Roll-Fed Media" on page 3-14).
   - **Media buckling or media feed problems** — the wrong media could be selected in the Media Wizard (see "Edge-to-Edge Printing" on page 3-35). The printer may not have been installed squarely or securely on the stand (see "Workflow Overview" on page 1-8). The media may not have been loaded squarely (see "Loading Roll-Fed Media" on page 3-14).

- **Head strike** — if the printhead is striking the media, check how the media is tracking from the supply spool to the takeup spool. The sides of the media should be parallel to the sides of the printer, with no wrinkling or buckling. If necessary, reload the media. See "Loading Roll-Fed Media" on page 3-14 for instructions. Also check the Media Wizard to see whether the correct media is selected (see "Edge-to-Edge Printing" on page 3-35). Head strikes may indicate that the printhead height is too low; see "Set the Printhead Height" on page 5-11 for instructions. If head strikes become a recur frequently, contact MacDermid ColorSpan Technical Services for an edge retainer that can be attached to the printer.

Head Strike Recovery

A head strike occurs when the media comes in contact with the bottom of the carriage while the carriage is in motion. The printer carriage is designed to protect the printheads from contact in the event of a head strike on media. It is important, however, to take steps after a head strike event to assure that the printheads have not come in contact with partially-cured ink.

Following a head strike, it may be possible to observe all known working jets firing correctly in the Prime Bar pattern or other printing. MacDermid ColorSpan recommends that even when the Prime Bars appear visually correct, the printheads be manually cleaned immediately after a head strike to ensure that no partially cured ink has been scraped from the media and deposited on or near the printhead orifices.

The ink will continue to cure at a low rate and could enter an orifice and cure the ink in the orifice even without subsequent exposure of the orifice area to UV. Once the ink starts to cure it continues for some time at a slow rate.

If previously known working jets are visually found to be missing from the Prime Bars after a head strike, a standard Purge should also be performed as part of the cleaning. The procedures for cleaning the UV printheads follows below.

1. Remove the left-side parking station from the printer.
2. Select "Access printheads" from the control panel, **OR**, at your option, select "Purge" from the control panel to perform a standard Air Purge.

   The carriage will travel to the left side, allowing access to the printhead jetting orifices.

3. Moisten an approved cleaning cloth with SolaChrome UV Printhead Flush Solution.

Beginning with the #16 printhead, lightly dab the printhead orifice plate with the moistened cleaning cloth, moving from the back of the printhead toward the front.

Note Do not wipe the printheads with a horizontal (front to back) motion of the cloth. Use a vertical dabbing (blotting up and down) motion, working your way across the printhead surface. The printheads have very small but very sharp features that can make small tears in the cloth, creating conditions for fiber particles to enter the jets and clog. The dabbing motion greatly reduces this possibility.

4. Repeat for each printhead, turning the cloth regularly and remoistening with head flush as necessary.
5. When all printheads have been cleaned, return the carriage to the right side of the printer and reinstall the left-side parking station.
6. Proceed with the remaining daily startup procedures as documented in this manual.

Warranty Claims

The printer is covered by a manufacturer's limited warranty (part number 0706278), which includes the printheads. The piezo printheads are designed to remain in service for the life of the printer.

The printer incorporates many automatic and manual features for preventing clogs from occurring, and for recovering inkjets that do become clogged (see "Recover Missing Ink Jets" on page 5-7). The warranty terms require that the maintenance procedures contained in this *User Manual* are followed prior to classifying a printhead anomaly as a "printhead failure."

A printhead failure is defined as any printhead that develops one or more individual jets that do not fire *and* that cannot be recovered or replaced ("mapped out") by the AutoJet or Manual Jet Mapping software when printing in Production Mode. If the jet(s) can be mapped out by the software in Production Mode, the printhead is deemed to be working satisfactorily and is not considered to have a failure.

In the event of a printhead failure as defined above, the cause and/or circumstances that lead to the failure must be identified. The following is a list of causes and/or circumstances that may lead to printhead failure. This list is not considered comprehensive, and any causes and/or circumstances that are not identified in this list will be evaluated on a case-by-case basis.

All printheads submitted for warranty claims will be subjected to failure analysis to confirm the cause of failure. The final determination of warranty applicability will be provided by this analysis.

For more information about warranty claims, contact ColorSpan Technical Services (see page ii for contact information).

Causes that are covered by the manufacturer's warranty:

- **Manufacturing defect** — when a flaw in materials or workmanship causes a printhead to fail, the failure will be covered by the manufacturer's warranty.

Causes and/or circumstances that are not covered by the manufacturer's warranty:

- Third party hardware or software
- Damage caused by accident, abuse, misuse (including damage resulting from head strikes or use of non-approved supplies), misapplication, relocation of product without

approved procedures, failure to perform user maintenance as defined in the *User Manual* or contamination of the ink supply due to improper handling of the ink or ink system

- Printheads which have not been properly maintained as defined in the *User Manual,* and printheads with jet-outs that AutoJet is able to substitute in Production print mode
- Service (including upgrades and expansions) performed by anyone who is not a ColorSpan Authorized Service Provider
- Modification of the product without the written permission of ColorSpan
- Product on which the ColorSpan serial number has been removed or defaced or for which you cannot provide proof of purchase and payment
- Software (whether embedded in ROMs or other hardware or contained on diskettes or other media), including related manuals and documentation, its quality, performance, merchantability or fitness for any particular purpose

Diagnostics

The printer includes a series of self-diagnostic tests designed to help MacDermid ColorSpan Technical Services solve printer hardware problems. If one of the tests encounters an error, and error message appears, which includes:

- Error code — always write down this code for future reference by MacDermid ColorSpan Technical Services.
- Brief description of the error
- A series of buttons that allow you to respond to the error. In some cases, you can ignore the error or enter a further diagnostic routine. In other cases, you must restart the printer.

During the course of operating the printer, another class of error messages may appear on the control panel. In Novice mode, the ATTN (Attention) key blinks on the Ready or Front Page screen when the printer detects an error condition, or potential error condition. When you press this button, the panel displays one or more messages of the following types:

- **Warnings** — the printer has detected a condition that, if left unaddressed, could result in substandard prints or a condition that will require an action before printing can continue. Any action on your part is optional.
- **Actions** — the printer has detected an error condition that stopped printing or will prevent printing from starting. You must correct the error before the printer will be ready to print.

(In Expert mode, you can display current messages via the menu option, **Warnings & Actions**.)

See Table B-1. on page B-10 for a description of the Action and Warning messages in detail. The page numbers are cross-references to this manual.

MacDermid ColorSpan Technical Services

You can obtain help using your MacDermid ColorSpan product from a variety of sources. This section shows you where to seek help, and introduces you to the support available to registered MacDermid ColorSpan customers.

Help From Your Reseller

The ColorSpan authorized reseller from whom you obtained this product can provide you with local support, consumables, and spare parts.

Help From ColorSpan

The printer control panel includes a Help button (**?**) that when pressed displays information about the current function.

Context-sensitive Online Help is available in ColorSpan print server products. Just click the Help button, select Help from the closest menu or press the F1 key.

The ColorSpan user manuals are your most immediate and complete source of information for using your ColorSpan product. The manuals are also located on the Print Server Software CD-ROM in Adobe Acrobat format. (And let us know what you think of the documentation by sending us e-mail at **documentation@colorspan.com**.)

ColorSpan also offers a variety of technical support options via the World Wide Web and e-mail:

World Wide Web	http://www.colorspan.com/
E-mail	support@colorspan.com

If All Else Fails

Call MacDermid ColorSpan Technical Services directly. Be ready to supply the technician with details about your system's configuration and details about the problem, including the exact wording of any error messages that appear. The Technical Services telephone numbers appear on page ii (the copyright page) of this manual.

The **Print Info Pages** function of the Service Printer menu is available to provide ColorSpan Technical Services with detailed troubleshooting information. As requested by Technical Services, from the menu (**Service Printer > Print Info Pages**), print, photocopy the pages onto plain paper, and fax them to the number provided.

Table B-1. Action and Warning Messages

Description	Cause	What to do
(HW) Head Warmer		
A-HW-[41-56] Printhead [n] Warmer Too Warm	The printhead has gotten too warm.	Contact your ColorSpan Authorized Service Provider or ColorSpan Technical Support.
A-HW-[61-76] Printhead 1 Setpoint Too Warm	The printhead setpoint is too high.	Contact your ColorSpan Authorized Service Provider or ColorSpan Technical Support.
W-HW-[1-16] Printhead [n] Warmer Disconnected	The printhead warmer indicated is disconnected or not functional.	With the printer power off, ensure that the head warmer is connected and restart the printer. If the problem continues, contact your ColorSpan Authorized Service Provider or ColorSpan Technical Support.
W-HW-[21-36] Printhead [n] Warmer Wiring	The printhead warmer and thermister may be wired incorrectly.	Contact your ColorSpan Authorized Service Provider or ColorSpan Technical Support.
W-HW-[41-56] Printhead [n] Warmer Too Warm	The printhead has gotten too warm.	Contact your ColorSpan Authorized Service Provider or ColorSpan Technical Support.
W-HW-[61-76] Printhead [n] Setpoint Too Warm	The printhead setpoint is too high.	Contact your ColorSpan Authorized Service Provider or ColorSpan Technical Support.
(IS) Ink Sensing		
A-IS-[n] [color] Out Of Ink	The off-head ink reservoir indicated is out of ink.	Refill off-head ink reservoir.
A-IS-[21-24] [color] Missing Ink Profiler	The ink profiler indicated is not detected.	Ensure that the ink profiler is installed.
A-IS-30 Profiler Setup Error	Ink profilers in wrong positions or incorrect ink profiler inserted.	Change profilers to match ink order or insert correct profiler for ink type.
A-IS-[31-34] Incorrect [color] Profiler	The profiler indicated is the wrong color or the wrong ink type.	Replace the profiler with appropriate profiler.
A-IS-[41-44] Invalid [color] Profiler	The profiler indicated is not valid.	Replace the profiler with appropriate profiler.

Table B-1. Action and Warning Messages

Description	Cause	What to do
A-IS-[61-64] [color] Air Sensor Failed	On-Head Air Sensor Failure.	Air sensor may be shorted or non-functioning. Replace or reposition sensor.
A-IS-[65-68] [color] Ink Sensor Failed	On-Head Ink Sensor Failure.	Ink sensor may be shorted or non-functioning. Replace or reposition sensor.
A-IS-[71-74] [color] Printheads Out Of Ink	Unable to fill printheads indicatd with ink.	Check the ink reservoir for a low ink level, check attention items for a failed ink thermister, make sure that the ink filter is not full, and check the tubing and pump functionality.
A-IS-75 Ink System Disabled	Error in ink system was detected.	Check pump connections, as well as data cables to OHS board. Fix the error and restart the printer.
A-IS-76 Ink System Disabled	Black: Room temp is out of range for operation.	Room temp is too warm or too cool. Correct room temp, or, if too cool, load media and allow platen heaters to provide heat.
A-IS-77 Ink System Disabled	Cyan: Room temp is out of range for operation.	Room temp is too warm or too cool. Correct room temp, or, if too cool, load media and allow platen heaters to provide heat.
A-IS-78 Ink System Disabled	Magenta: Room temp is out of range for operation.	Room temp is too warm or too cool. Correct room temp, or, if too cool, load media and allow platen heaters to provide heat.
A-IS-79 Ink System Disabled	Yellow: Room temp is out of range for operation.	Room temp is too warm or too cool. Correct room temp, or, if too cool, load media and allow platen heaters to provide heat.
A-IS-[80-83] [color] Heads Not Loaded With Ink	The printheads indicated do not have ink loaded.	Run the ink load procedure.
A-IS-[84-87] [color] Ink Sensor Disconnected	On-Head Ink Sensor indicated is disconnected.	Reconnect Ink Sensor.
A-IS-[88-8B] [color] Air Sensor Disconnected	On-Head Air Sensor indicated is disconnected.	Reconnect Air Sensor.
A-IS-[90-93] [color] Pump Disconnected	Ink pump indicated was disconnected.	Reconnect pump and restart printer.

Table B-1. Action and Warning Messages

Description	Cause	What to do
A-IS-[101-102] Ink Counting Not Working	Ink Counting Mechanism indicated has failed.	Replace ink counting mechanism.
A-IS-120 OHS Read/Write Failure	Failed to communicate with OHS board.	Reseat the profilers and ensure they are inserted correctly. Check OHS board cable connections. If the problem continues after resetting this error, contact your ColorSpan Authorized Service Provider or ColorSpan Technical Support.
W-IS-[n] [color] Low Ink	Ink reservoir indicated is low on ink.	Refill the ink reservoir soon.
W-IS-8 Replace Reservoir Filters	The ink reservoir filters need replacing.	Replace the ink reservoir filters.
(LE) Left End		
A-LE-1 A-LE-1 Cover Open or Removed	The UV parking station or the wiping station cover has been removed.	Replace the covers to enable the UV lamps.
(LS) Light Sensor		
W-LS-1 Image Sensor Is Not Operating	The image sensor shutter cable is disconnected.	Connect the image sensor shutter cable and restart the printer.
W-LS-2 Image Sensor Is Not Operating	The image sensor cable is disconnected.	Connect the image sensor cable and restart the printer.
(MD) Media Drive		
A-MD-1 Media Advance Stalled	The media drive motor has stalled.	Check supply spool for binding, motor for failure.
(MS) Media Sensing		
A-MS-3 Media Too Far Left/Right	The media loaded is too far to the left or to the right.	Reloaded a media; align right edge to reference mark.
A-MS-4 Media Out	There is no media loaded.	Load media.
A-MS-5 Media Too Narrow	Media is not wide enough for printing.	Load media that is at least 24 inches wide.

Table B-1. Action and Warning Messages

Description	Cause	What to do
A-MS-6 Thickness Sensor Disconnected	The media thickness sensor is disconnected or reading an invalid value.	Ensure that the media thickness sensor is connected and calibrated. If the problem persists, contact your ColorSpan Authorized Service Provider or ColorSpan Technical Support.
W-MS-1 Media Low	Between 10 feet (3 meters) and 1 foot (30 cm) or less of media remains.	Load media.
W-MS-4 Media Advance Switch Detected	Media Advance Switch on back of printer was depressed.	Use the Load or Unload button to finish operation.
W-MS-6 Media Too Wide	Media is too wide for printing.	Use narrower media. See manual for specifications.
(PR) Pinch Rollers		
A-PR-1 Pinch Rollers Up	The pinch rollers are up, in the media release position.	Lower the pinch rollers and lock them into the appropriate slot. Refer to the current media settings for determining the correct slot. If media is out, run the media load procedure.
(PC) Printer Calibration		
W-PC-2 Media Replaced - Recalibrate	Media advance accuracy may need to be recalibrated.	Calibrate media feed if media type was changed.
W-PC-3 Head Height Changed - Recalibrate	Change in head height has invalidated calibration.	Run Autoset.
W-PC-4 Jets Not Replaced	Not all missing jets could replaced.	Prime/clean cartriges, or increase the print mode quality.
W-PC-6 Uncalibrated Pass Mode	Print mode selected has media advance rate different from the calibrated advance rate, which may cause banding.	Calibrate media feed.
W-PC-7 Platen Width Not Known	Measurement was reset or not performed.	Restart printer to measure platen width.
W-PC-8 Thickness Sensor Uncalibrated	The media thickness sensor has not been calibrated.	Calibrate the sensor using the menu item in the service menu.

Table B-1. Action and Warning Messages

Description	Cause	What to do
(SM) System		
A-SM-1 Printer Not Personalized	Invalid electronics assembly.	Call your ColorSpan Authorized Service Provider or ColorSpan Technical Support for replacement electronics.
A-SM-2 Invalid Software	Invalid software found.	Call your ColorSpan Authorized Service Provider or ColorSpan Technical Support for updated software.
A-SM-3 Invalid Personalization	Printer personality incorrect.	Call your ColorSpan Authorized Service Provider or ColorSpan Technical Support for replacement electronics.
W-SM-1 Printer Not Reset For Shipping	Defective electronics assembly.	Call service provider for replacement electronics.
W-SM-2 Head Voltages Not Set	More than 8 heads have default voltages.	Run procedure to set head voltages.
(SP) Supply		
A-SP-1 Supply Too Small	The supply spool is too small.	Change the supply to idle
A-SP-2 Supply Too Large	The supply spool is too large.	Reload the supply with a smaller spool.
W-SP-1 Supply Media Out Detection Off	Media-out detection using the supply roll is disabled.	Re-enable Supply Media Out Detection. Be careful to watch for media-out condition.
(TU) Takeup		
A-TU-1 Takeup Full	The media takeup spool is full.	Unload the takeup spool and reload takeup or reload media.
A-TU-2 Takeup Stall	The takeup motor has stalled.	See manual for recovery procedure.
A-TU-4 Takeup Too Small	The media takeup spool is too small.	Unload the takeup spool and reload takeup with a larger spool
W-TU-1 Takeup Too Large	The media takeup spool is larger than recommended.	Unload the takeup spool and reload takeup or reload media.

Table B-1. Action and Warning Messages

Description	Cause	What to do
(UV) UV Lamps		
A-UV-1 Right UV Lamp Disabled	The right UV lamp has been disconnected or has overheated.	If the lamp is disconnected, power down the printer and reconnect the cable. If the lamp has not been disconnected, allow the lamp fan to run and wait for the lamp to cool.
A-UV-2 Left UV Lamp Disabled	The left UV lamp has been disconnected or has overheated.	If the lamp is disconnected, power down the printer and reconnect the cable. If the lamp has not been disconnected, allow the lamp fan to run and wait for the lamp to cool.
A-UV-3 UV Control Error	The printer is unable to communicate with the UV lamps' control board.	Check cable connections and restart the printer. If the problem continues, contact your ColorSpan Authorized Service Provider or ColorSpan Technical Support.
A-UV-4 UV Control Error	The UV lamps' control board revision is unsupported.	Contact your Authorized Service Provider or Technical Support to have it upgraded.
A-UV-6 UV Control Error	The printer is unable to communicate with the UV power supply.	Ensure the power to the UV power supply is turned on and that the data cable is connected. If the problem continues, contact your Authorized Service Provider or Technical Support.
A-UV-7 UV Control Error	The UV lamps' power supply revision is unsupported.	Contact your Authorized Service Provider or Technical Support to have it upgraded.
A-UV-10 UV Shield Up	The UV shield on the front of the carriage has been raised.	Lower the shield to allow the UV lamps to turn on and to allow printing.
W-UV-1 Right UV Lamp Needs Replacing	The right UV lamp is nearing its life expectancy.	The right UV lamp should be replaced to ensure optimal curing performance.
W-UV-2 Left UV Lamp Needs Replacing	The left UV lamp is nearing its life expectancy.	The left UV lamp should be replaced to ensure optimal curing performance.

Table B-1. Action and Warning Messages

Description	Cause	What to do
W-UV-3 UV Lamps Not Synchronized	There is over a 300 hour difference in the amount of time that the right and left UV lamps have used.	To ensure optimal curing performance, it is recommended that the lamps are replaced.
W-UV-4 Shield Was Raised	The UV shield on the front of the carriage was raised. This will shut off the UV lamps and cancel any print job.	Make sure the UV lamp shield is not raised while the lamps are on or while printing.
(VN) VideoNet		
W-VN-1 VideoNet Connection Not Detected	The printer cannot detect a print server.	Connect cable, turn on server, add printer to server.
(VS) Vacuum System		
W-VS-1 Vacuum Pressure Too Low	The vacuum pressure of the heads is too low.	Manually adjust the vacuum pressure using the dial on the vacuum/pressure assembly in the back of the printer. The nominal pressure should be 7.25 "H20 to 8.25 "H20. Also, check for the vacuum/pressure system for leaks.
W-VS-2 Vacuum Pressure Too High	The vacuum pressure of the heads is too high.	Manually adjust the vacuum pressure using the dial on the vacuum/pressure assembly in the back of the printer. The nominal pressure should be 7.25 "H20 to 8.25 "H20.
W-VS-3 Vacuum Pressure Not Recovering	The vacuum pressure of the heads is not recovering after an air purge.	Check vacuum pressure system to ensure it is working properly and check vacuum tubing for leaks.

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